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## JOURNAL INFORMATION

Catesbeiana is published twice a year by the Virginia Herpetological Society. Membership is open to all individuals interested in the study of amphibians and reptiles and includes a subscription to Catesbeiana, two newsletters, and admission to all meetings. Annual dues for regular membership is $15.00. Payments received after September 1 of any given year will apply to membership for the following calendar year.

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(Editorial policy continued on inside back cover)

Cover Photo: New Jersey Chorus Frog from Doe Creek Wildlife Management Area (see p 46).

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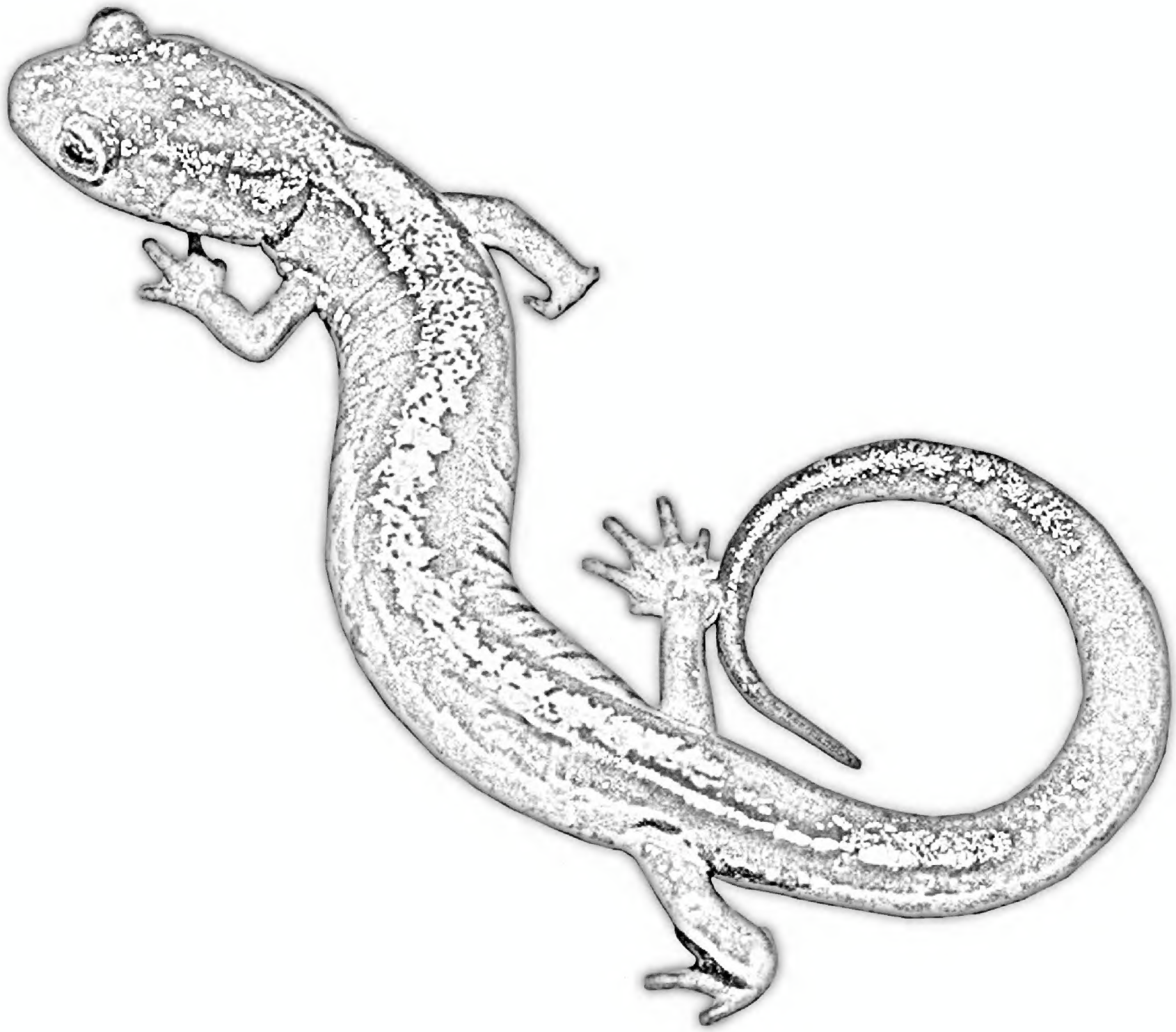

Shenandoah Salamander,  John White

# Sixteenth Annual HerpBlitz: Survey of Doe Creek Wildlife Management Area

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**Abstract:** Doe Creek Wildlife Management Area in Accomack County, Virginia was surveyed for herpetofauna on 4-5 March, and 4-5 June 2022. A total of 15 species (9 anurans, 1 snake, 4 turtles, and 1 lizard) were found during the survey. Three species, *Pseudacris kalmi*, *Chelydra serpentina*,. *Terrapene c. carolina* are listed in Virginia's 2015 Wildlife Action Plan as species with special conservation needs.

**Keywords**: Herpetological survey, wildlife management area, *Pseudacris kalmi*, Accomack County

## INTRODUCTION

Doe Creek Wildlife Management Area (DCWMA) was the site of the sixteenth annual HerpBlitz sponsored by the Virginia Herpetological Society. DCWMA is a 180-hectare (446 acre) upland mixed pine and hardwood forested area on the Chesapeake Bay side of the Eastern Shore, near the town of Onancock in Accomack County. The terrain is flat, with sandy soil. This site features numerous dirt roads bordered by man-made ditches that collect rainfall and divert it to several managed man-made wildlife impoundments to provide sufficient hydrology to wetlands for waterfowl hunting. The ditches line one or both sides of the roads and are about two meters deep but may only contain a maximum of a meter of water after rainfall. The wildlife impoundments were large, up to 0.8 km long, and held a third to half a meter of water when DCWMA was visited in March and June. Because of the sandy soil, the forests were relatively dry,

although there were some small vernal pools that likely had a short hydroperiod.

DCWMA was chosen for the sixteenth HerpBlitz since few Virginia Herpetological Society (VHS) surveys have occurred on the Eastern Shore. The Eastern Shore is also the only area in the Commonwealth where the New Jersey Chorus Frog (*Pseudacris kalmi*) can be found, and few VHS members had ever been exposed to this species. There was also a desire to determine which leopard frog occurred on the Eastern Shore (*Lithobates s. utricularius* or *L. kauffeldi*).

## MATERIALS AND METHODS

### Study Sites

Site 1: Along dirt roads leading from the Kiosk/Parking Area (37° 45' 59.2" N; 75° 43' 47.3" W) north. Most roads were lined with ditches containing less than 25 cm water in March and up to a meter in June. Beyond the ditches were mixed hardwoods and mature pine forests. There was an equipment storage area consisting of a roof supported by steel beams but no walls with adjacent artificial cover objects such as several boards, sheets of metal, and large (approximately 1-meter diameter) plastic pipes.

Site 2: A flooded man-made wetland with approximately 25 cm of water and various emergent plants growing in the wetland. The wetland was surrounded by mature mixed deciduous and pine forests.

Site 3: Along dirt roads, east then north from the Kiosk/Parking Area with ditches and man-made wetlands off the roads. The west side was mostly mixed deciduous and pine forests. The east side included ditches with shallow wetlands when DCWMA was visited in March and were dry in June.

Doe Creek WMA was surveyed preliminarily by two individuals on 4-5 March 2022 and with seven volunteers on 4-5 June 2022. Weather conditions on all survey efforts were sunny. Temperature on 4 June was 23°C at 8:45 am when the survey began and was 30°C at 1:20 pm. Survey participants used multiple collecting methods searching for amphibians and reptiles. These included visual observations, listening for calling anurans, hand and dip-net capture, turning over then replacing logs and other cover objects, and the use of five hoop turtle traps baited with sardines, two crayfish traps again baited with sardines, and five unbaited minnow traps. Captured animals were examined for diseases, parasites, and anomalies prior to their release. Digital photographs were taken of most species as vouchers. Data was recorded on VHS survey forms.

## RESULTS

A total of 160 individual animals from 15 species (9 anurans, 1 snake, 4 turtles, and 1 lizard) were found during the survey of DCWMA (Table 2). Twenty-one individuals were recorded on 4-5 March, with the remainder on 4-5 June 2022. Among these, the New Jersey Chorus Frog was a tier IVc species, the Woodland Box Turtle a tier IIIa species, and the Snapping Turtle a tier IVb species. The only injuries or disease observed was one of the Eastern Painted Turtles missing its right rear foot (most likely from a predator attack when young) and the one Woodland Box Turtle observed appeared to have a small section of the carapace with shell rot. Species names follow Crother (2017).

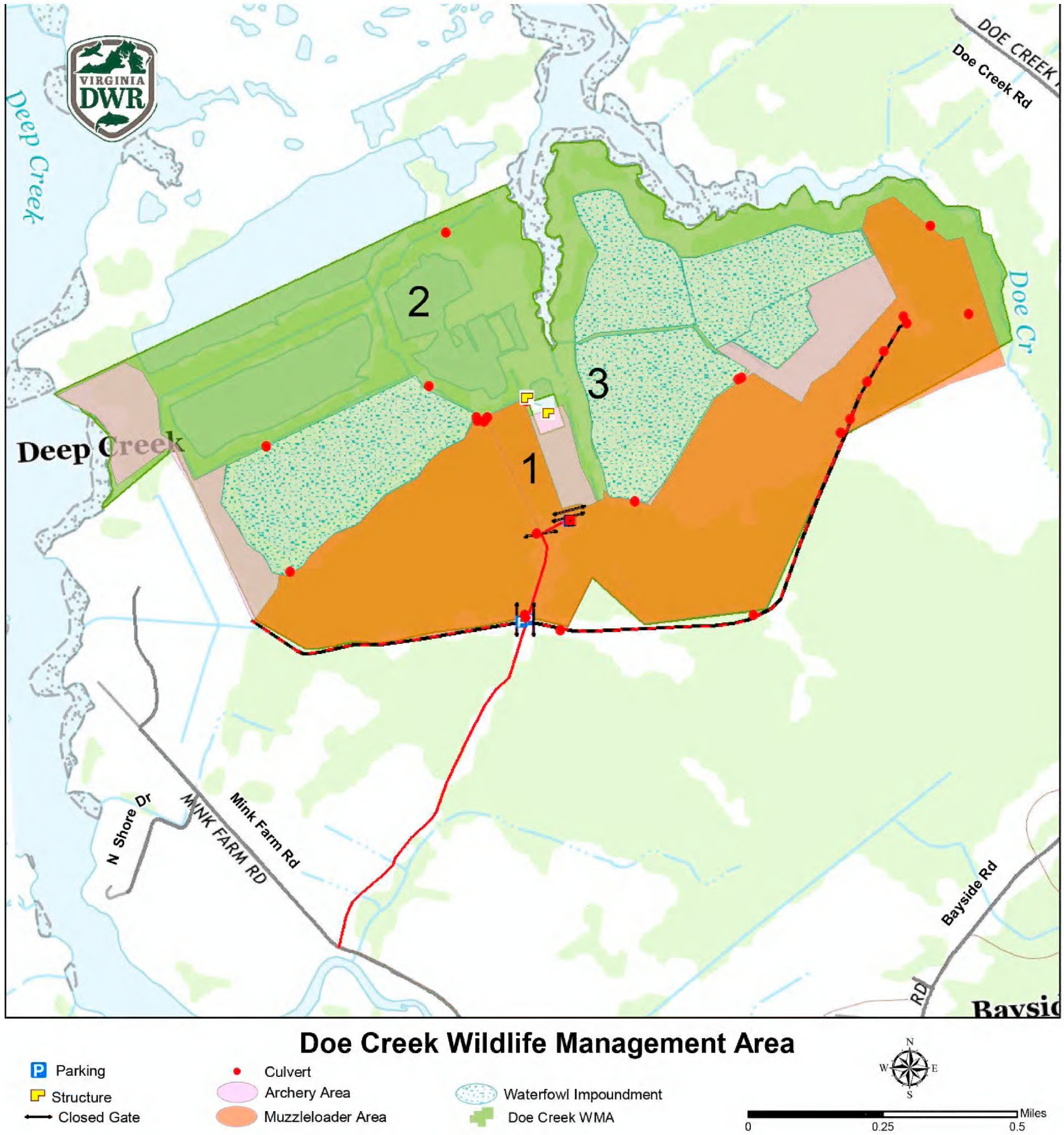


Figure 1. Map of DCWMA with sites labeled. Map from DWR.

Table 2. Summary of animals observed per site at DCWMA.

| Species/Site | 1 (March 4) | 2 (March 4 at Night) | 1 (June 4) | 1 (June 4 at Night) | 3 (June 5) | Total |
|---|---|---|---|---|---|---|
| **Amphibians** | | | | | | |
| *Anaxyrus fowleri* | | | 6 | 52 | 3 | 61 |
| *Gastrophryne carolinensis* | | | 1 | 3 | | 4 |
| *Hyla cinerea* | | | | 8 | | 8 |
| *Hyla chrysoscelis* | | | 1 call | 6 call | | 7 |
| *Lithobates catesbeianus* | | | 3 | | | 3 |
| *Lithobates clamitans* | | | 8 call | 1 call | | 9 |
| *Lithobates s. utricularius* | | 3 | 6 | 12 | | 21 |
| *Pseudacris crucifer* | | 2 | 2 | | | 4 |
| *Pseudacris kalmi* | | 7 | | | | 7 |
| | | | | | | |
| **Reptiles** | | | | | | |
| *Coluber c. constrictor* | 1 | | 1 skin | | 1 skin | 3 |
| *Chelydra serpentina* | | 1 dead | | | | 1 |
| *Chrysemys p. picta* | 7 | | 12 | | | 19 |
| *Kinosternon s. subrubrum* | | | 2 | | | 2 |
| *Terrapene c. carolina* | | | 1 | | | 1 |
| *Scincella lateralis* | | | 9 | | 1 | 10 |
| | | | | | | |
| **Total** | 8 | 13 | 52 | 82 | 5 | 160 |

**Annotated Checklist**

**Amphibians:**

1. *Anaxyrus fowleri* – Fowler's Toads were the most numerous species observed. All age classes were seen, from metamorphs to adults. Most toads were observed during night hikes, along the dirt roads traversing DCWMA. On the evening of 4 June, 52 toads were picked up, measured for SVL and weight, and released. On the evening of 4 June males were heard calling from the shallow areas of the wildlife impoundments. Four toads were found under a piece of plywood at site 1. Two of those had dug themselves halfway into the sand under the plywood so only the head and shoulders were visible.

2. *Gastrophryne carolinensis* – Eastern Narrow-mouthed Toads were found at site 1. An adult was found under a cover object at

the pavilion. An adult and two juveniles were found on the dirt roads at site 1 during the night hike on 4 June.

3. *Hyla cinerea* – Green Treefrogs were calling from the shallow wildlife impoundments on the evenings of 4-5 June. A chorus of approximately two dozen individuals were active in one shallow impoundment and more in a deeper one north of site 2. One small adult was found on the road during the 4 June night hike.

4. *Hyla chrysoscelis* – Cope's Gray Treefrogs were calling from the wildlife impoundments in site 1 on the evenings of 4 March and 4 June. One male was heard calling from the woods during the day at site 1.

5. *Lithobates catesbeianus* – American Bullfrogs were present in the ditches running parallel to the roads at site 1. On 21 May 2021, bullfrogs were heard calling from the ditches at site 1. On 4 June 2021, we observed a bullfrog calling from a roadside ditch. A small adult was captured in a minnow trap in a shallow ditch at site 1 on 4 June. Several adults were observed on the shore of some of the deeper ditches at site 1.

6. *Lithobates clamitans* – Green Frogs were heard calling occasionally from the ditches at site 1 during the day and the evening of 4 June 2022.

7. *Lithobates s. utricularius* – One dead adult Coastal Plains Leopard Frog and two adult male frogs were collected in a flooded wildlife impoundment pond on 5 March 2022. The dead adult was badly decomposed so the cause of death could not be determined. During the day on this date, fresh egg masses and older egg masses with hatching tadpoles were observed in shallow water. Many males were observed calling from two impoundment ponds on the above date. Leopard frogs were calling the evening of 4 March in the shallow wildlife impoundment at site 2. Newly metamorphosed frogs were leaving the ditches and impoundments in June. Six were seen during the day along the roads in site 1. During the night hike in the same area on the evening of 4 June, twelve individuals were seen.

8. *Pseudacris crucifer* – Spring Peepers were calling the evening of 4 March in the shallow wildlife impoundment at site 2. Two were captured by dip netting and released. Two subadults were seen together on the forest floor at site 1 during the day on 4 June.

9. *Pseudacris kalmi* – New Jersey Chorus Frogs were found at sites 1 and 2 on 5 March 2022. Both sites were man-made flooded wildlife impoundments. During the day and night, males were heard calling from the grassy flooded wildlife impoundments. No eggs were observed at this time. While several dozen New Jersey chorus frogs were

calling on 5 March, only seven were captured, measured, then released. None were seen in any area in June.

**Reptiles:**

10. *Coluber c. constrictor* – On 4 March 2022, an adult Norther Black Racer was found under a sheet of metal at an equipment and materials storage area near the central parking area at site 1. Two shed skins were found in June, one in site 1 and the other in site 3. The snakes were identified as Northern Black Racers based on the scalation of the sheds.

11. *Chelydra serpentina* – The dead carcass of a Snapping Turtle was found on the shore of the shallow wildlife impoundment at site 2. Since the carcass was large and on land next to its typical aquatic habitat, it is possible this was a female which came ashore to lay eggs.

12. *Chrysemys p. picta* – Eastern Painted Turtles were common in the ditches lining the roads throughout the WMA. On 5 March 2022, we observed seven painted turtles basking on branches and logs in roadside ditches at sites 1 and 3. Several were captured in turtle hoop traps set in the ditches in site 1 on 4 June. Others were observed basking on logs in those same ditches.

13. *Kinosternon s. subrubrum* – Two adult Southeastern Mud Turtles were captured in traps set in the ditches lining the roads at site 1 on 5 June.

14. *Terrapene c. carolina* – A single Woodland Box Turtle was found during the survey. It was a large adult female (139 mm CL) found wedged between two large plastic pipes at the storage area at site 1 on the morning of 4 June. It is likely the turtle was using the artificial cover to spend the night with some protection.

15. *Scincella lateralis* – The Little Brown Skink was common at the WMA. They were observed at both sites 1 and 3. Some were found under various cover objects and others were out on the forest floor, presumably foraging among the leaf litter. The 10 observed made this the most frequently observed reptile after the Eastern Painted Turtle, which were more obvious as they were basking on logs in the ditches.

## DISCUSSION

Previous work on the herpetofauna of the Eastern Shore is summarized in Gibson (2011) which compiles information from Mitchell (1999 and 2002), Roble et al. (2000) and Roble (2001) on Eastern Shore herps. The Eastern Shore is not known for the diversity of herpetofauna. The Virginia Fish and Wildlife Information Service (FWIS) Database lists 22 amphibians and 33 reptiles

for Accomack County and 19 amphibians and 23 reptiles for Northampton County. The fifth Annual HerpBlitz at Kiptopeke State Park found only 13 species of herps, and this sixteenth Annual HerpBlitz at DCWMA found only 15 (9 amphibians and 6 reptiles). Mitchell (1999) suggested the low presence of herps in this area is due to the fact these counties were once islands prior to the Pleistocene, and because extensive habitat modifications were made by agricultural draining of the wetlands by European settlers.

A species targeted by this HerpBlitz was *Pseudacris kalmi*, the New Jersey chorus frog. The species in Virginia is known only from the Eastern Shore and the survey at DCWMA was an opportunity to observe the species firsthand. While *P. kalmi* were heard and seen in March, unfortunately, none were seen or heard in June. *Pseudacris kalmi* and their congenator *P. crucifer*, the spring peeper, were both abundant judging from calls heard in March. While calling and non-calling males were observed on 4-5 March, we did not observe amplexis or eggs, which presumably would occur later. J.D. Kleopfer (personal communication) observed and photographed an amplexed pair of *Pseudacris kalmi* on 11 March 2021 in a ditch at DCWMA.

Anurans are well represented at DCWMA. The (FWIS) lists fifteen species for Accomack County. All species except *Acris crepitans*, *Anaxyrus a. americanus, Lithobates palustris, L. sylvaticus* and *Scaphiopus holbrookii* were observed or heard during the surveys for this report. The American toad is reported only at a few sites farther north in the county and likely not present on the DCWMA. The Eastern Spadefoot is likely to be encountered only during heavy rains, which we did not experience during our surveys. J.D. Kleopfer reported a large chorus in 2022 near Exmore, to the south in Northampton County (personal communication). FWIS records also report them from Accomack County, north and south of DCWMA. With the sandy soil present, Eastern Spadefoots are likely at DCWMA and could be found if a survey coincided with heavy rains. Joe Mitchell reported Eastern Cricket Frogs both north and south of DCWMA, and the habitat would seem ideal for them with the presence of streams, ditches, and wetlands. The surveys for this report spent the majority of time near these bodies of water. If cricket frogs were present on the DCWMA we would have expected to see them. Since we did not, we must presume they are absent at this locality. The older Mitchell VAFWIS records do not give numbers of animals observed, so we cannot tell the relative abundance of cricket frogs previously reported.

There is only a single record of Pickerel and Wood Frogs in Accomack County (FWIS Database). The Pickerel Frog record is from the north end of Wallops Island, north of DCWMA. It is likely they are rare in the county, although suitable habitat is present. A Wood Frog record is from the north end of Paramore Island, to the south of DCWMA. Wood Frogs could be present at DCWMA, although the eggs are quite distinctive and were not observed in March when one would expect them to be seen. If they are present, they must be quite rare.

The wetlands at DCWMA provide abundant habitat for anurans, and many species are well represented. We observed large numbers of Fowler's Toads and Coastal Plains Leopard Frogs. Both were calling in March during the preliminary scouting and metamorphs of both species were observed emerging from the impoundments in June. Other species of frogs may be less numerous at DCWMA, but were still relatively abundant, particularly calling males, during

our brief time there. There is no doubt the many and varied types of aquatic habitats provide excellent habitat for many anuran species.

The lack of captures of any salamanders during the survey was perplexing. There are six documented species of salamanders residing on the Eastern Shore. These include *Ambystoma maculatum*, *A. opacum*, *Eurycea cirrigera*, *Hemidactylium scutatum*, *Notophthalmus v. viridescens*, and *Plethodon cinereus*. The habitats at DCWMA seemed ideal for *Notophthalmus v. viridescens* and the Ambystomatid salamanders, however none were found. *Ambystoma tigrinum* has not been documented on the Virginia Eastern Shore. There are two unvouchered historical accounts of *Ambystoma tigrinum* being reported in Somerset and Worcester counties in Maryland (Stine, 1984), which borders Accomack County. This species in the past may have lived in one of numerous Carolina Bays on the Virginia Eastern Shore but has since been extirpated when these habitats were drained or converted into agricultural land. *Pseudotriton m. montanus* has been documented in Worcester County and should be a species considered possible to find on the Virginia Eastern Shore with more intensive searching (White and White, 2002; Cunningham et al., 2018).

The aquatic habitats present at DCWMA, particularly the ditches, provide excellent habitat for turtles. We observed all size/age classes of painted turtles in large numbers. However, we were surprised at the low number of Snapping Turtles. The only observation was the skeleton of a large adult on the shore of one of the impoundments. We did not catch any in the baited hoop traps. Another surprise was the single box turtle; however, we did not spend as much time surveying terrestrial habitats as aquatic ones.

There were surprisingly few lizards at DCWMA. We found Little Brown Skinks at sites 1 and 3 in June. They seemed to be quite abundant. We did not find any Common Five-lined or Eastern Fence Lizards, which are typically abundant at more inland sites in Virginia. The FWIS Database does have records for Accomack County, but there are only single Common Five-lined Skinks reported in each record, and no recent records for the Eastern Fence Lizard in the county. The drier sandy substrate and mixed pine-hardwood forests would seem to be ideal habitat for lizards, however, the large-scale agricultural use of the lands may be negatively affecting lizard populations at DCWMA.

Most surprising was the low number of species and individuals of snakes. Again, we spent most of the survey near aquatic habitats, but we checked logs in forests, and a relatively large number of artificial cover objects in site 1 that held only one Northern Black Racer. The only other evidence of snakes we saw were two shed skins from black racers. The VAFWIS Database does contain records for a number of snakes in Accomack County, however, most records seem to be from the barrier islands on the ocean side of the peninsula. DCWMA is on the Chesapeake Bay side of the peninsula. It is possible that again, the large-scale agricultural use of the lands has negatively affected snake populations. The barrier islands, prone to episodes of flooding, may provide refuge for snakes. It would be hoped that natural habitats, such as DCWMA, would also provide such refuge and contribute to increasing snake populations over time. We could find little information on the past history of the DCWMA. The Management Plan is still being constructed, leading one to suspect this is one of the more recently created wildlife management areas. DCWMA is protected from agriculture, and

managed for wildlife, should prove to be valuable for many types of wildlife into the future. It would be very interesting to revisit DCWMA in several decades to see if snake and lizard populations have increased.

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Group Photo:  Evan Spears, Lindsey Hottinger, Ty Smity, Jason Gibson, Kelly Geer, and Karl Kratzer, not pictured Paul Sattler

# Observations on the Development of Cope's Gray Treefrog (*Hyla chrysoscelis*)

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## Abstract

There is a small population of Cope's Gray Treefrogs (*Hyla chrysoscelis*) in a suburban neighborhood in Alexandria, Virginia. Naturally spawned eggs of Cope's Gray Treefrog were collected from a man-made amphibian pond the morning after evening spawning. *Hyla chrysoscelis* was identified and distinguished from the Gray Treefrog (*Hyla versicolor*) by spectrographic analysis of male advertisement calls. The normal development of fertilized eggs was monitored through early development, larval stages, and metamorphosis to juvenile frogs. Gastrulation was completed in 18 hrs. Embryos reached the neural tube stage by 1 day. Gill circulation occurred by day 2.5. Larvae began to feed at 7 days. The average time from fertilization to complete metamorphosis at 21-24 ºC. was 54.1 days +/- 3 s.d. (n = 10, range 49-59 days). Metamorphosed juveniles were then released near the spawning site.

**Key Words:** Cope's Gray Treefrog, *Hyla chrysoscelis*, early development, metamorphosis

## INTRODUCTION

On warm, humid, overcast twilight and early evenings in late April to July in Alexandria, Virginia, treefrogs call locally. They are Cope's Gray Treefrogs (*Hyla chrysoscelis*). They usually start calling at dusk high in white oaks, dogwoods, or pignut hickory trees, especially on warm, humid, rainy evenings. There are two gray treefrog species, morphologically indistinguishable but with distinctive advertisement calls (Johnson, 1966; Wasserman, 1970). Cytogenetic analysis revealed the Gray Treefrog (*Hyla versicolor*) is tetraploid; whereas, the Cope's Gray Treefrog (*Hyla chrysoscelis*) is diploid (Wasserman, 1970). Furthermore, spectral analysis of recordings of male advertisement calls revealed substantial differences. Their ranges overlap in northern Virginia (Powell, et al., 2016). These two species hybridize rarely in nature and laboratory-produced hybrids develop abnormally producing adults with reduced fertility (Johnson, 1963). Before these two species were known, a detailed description of Gray Treefrog tadpoles was published (Wright, 1929). Recordings of the calls of both species are available on the Website of the Virginia Herpetological Society. This report will describe development from fertilization to metamorphosis in Cope's Gray Treefrog.

## MATERIALS AND METHODS

Adult Cope's Gray Treefrog treefrogs were observed and seen breeding in Alexandria, Virginia (latitude 38.82, longitude -77.08). Fertilized eggs were observed on May 15, June 2, and June 13, 2022, from natural overnight spawning in a man-made amphibian pond. Most of the eggs were left in the pond, but a few were collected for observation and photography. Development was observed using a Wild dissecting microscope, and photography was with a digital Nikon D90 camera. Images were processed using Adobe Photoshop, attempting to make the captured images as true to life as possible. Once the embryos hatched, two groups of six were placed in

Falcon plastic petri dishes (100X15 mm, #351029), half full of purified water for observation of further development.

Developmental stages up to feeding were the same as used for *Lithobates pipiens* after Shumway (1940). Stages of metamorphosis were the same as used for *Lithobates pipiens* after Taylor and Kollros (1946). Larvae were fed with small, boiled lettuce leaves (organic, pesticide free). Once the larvae began feeding, the water was changed every other day to remove feces and remnants of uneaten food.

When larvae started feeding, they were raised in plastic aquaria with a base of 390 $cm^2$, with 1 liter of purified water, and one to three small, boiled lettuce leaves. Later stages were fed with four to seven small lettuce leaves. Larger tadpoles swam quickly and were difficult to photograph. Thus, they were placed in petri dishes, briefly anesthetized in MS-222 (0.005 % in purified water), photographed, rinsed three times in purified water, and allowed to recover before returning them to their aquaria.

Calls from two different males, each with the same sound, were recorded in my back yard on May 19, 2022, at dusk, on an Olympus SR5 digital recorder. Spectral analysis of recorded calls was done on May 20, 2022 at Cue Recording Studios in Falls Church, Virginia.

## RESULTS

Based on a spectral analysis of recorded calls, the local treefrogs are Cope's Gray Treefrogs. The interval between calls was 2.5 sec. (Figure 1). By expanding one call on the time axis, I found that each call consisted of 25 high-pitched trills, the entire call lasting 0.8 sec. (Figure 2). Gray Treefrogs, have calls with a lower pitch and a smaller number of trills in each call. In addition, calls are spaced about 5.0 sec apart and last about 3.2 sec (Johnson, 1966, Wasserman, 1970).

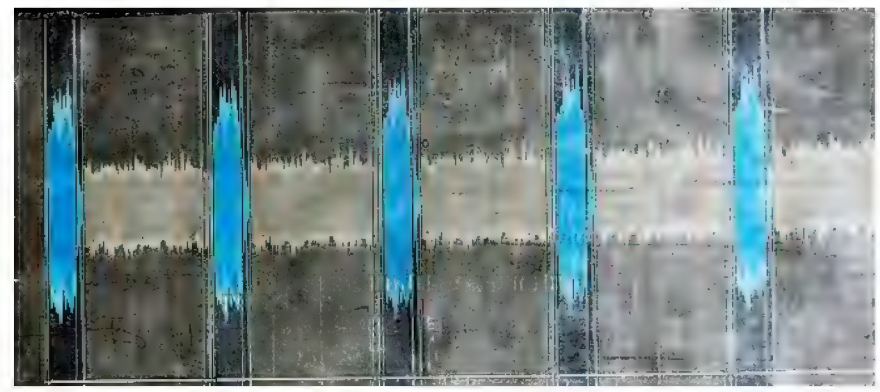


Figure 1. Spectrographs of Cope's Gray Treefrog Calls, Five Calls.

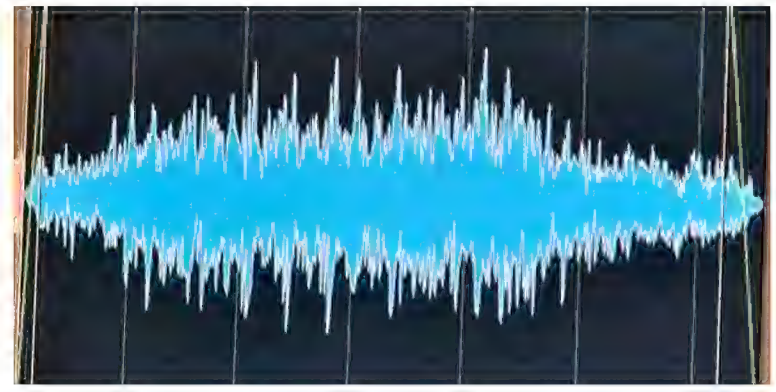


Figure 2. Spectrographs of Cope's Gray Treefrog Calls, One Call Expanded Time Scale.

In late April through mid-July 2022, I heard adult Cope's Gray Treefrogs calling from trees. There are several temporary ponds nearby and in 2021 some adults bred in them. I heard calling males in late April and early May 2022. On the evening of May 14, 2022, I heard a male calling but he stopped singing when approached. At midnight there were no calls. At 10 AM on May 15, 2022, the pond had 16 egg masses, distributed at random on the water's surface. The eggs were surrounded by a clear, elastic jelly and a robust vitelline membrane. Two eggs masses (3 cm X 1 cm) were collected. They contained 41 and 42, 1-mm eggs, respectively. There were about 600 eggs total in the pond. A large female can lay as many as 2,000 eggs, so it is likely that all 600 eggs came from one pair. Adults mate in shallow ponds and swamps, like toads, so their small embryos develop quite rapidly, metamorphosing quickly before leaving the

pond for dry land. I estimated that these eggs were fertilized at 10 PM, day 0. A few eggs were kept in petri dishes for observation, so when they hatched and started swimming and feeding, most were returned to the pond, but a few were kept in aquaria to observe larval development and metamorphosis.

On June 2, 2022, the early day was sultry and humid, but a front came through in the late afternoon, bringing rain and cooler temperatures. That evening, two male Cope's Gray Treefrogs were calling from my pond. On the morning of June 3, 2022, I found four small egg masses. I collected one, measuring 3-cm across and containing 32, 1-mm embryos. I estimated that the eggs were fertilized about 10 PM on June 2, 2022. Presumably, these new eggs came from a second female, meaning that there are at least two males and two females in my yard. These embryos were observed and photographed at closely spaced internals over the next 6.75 days (Table 1).

Table 1. Early Development of Cope's Gray Treefrog*

| Hours/Days | Date | T, °C | Stage | Notes | Time | Length |
|---|---|---|---|---|---|---|
| 0 | 6/2/22 | 21 | 0 | Uncleaved | 10 PM | 1.0 mm |
| 11 | 6/3/22 | 21 | 9 | Blastula | 9 AM | 1.0 mm |
| 14 | 6/3/22 | 23 | 10 | Early gastrula | Noon | 1.0 mm |
| 16 | 6/3/22 | 25 | 10 | Early Gastrula | 2 PM | 1.0 mm |
| 17.3 | 6/3/22 | 27 | 12 | Large Yolk Plug | 3.20 PM | 1.0 mm |
| 18 | 6/3/22 | 27 | 12 | Small yolk plug | 4 PM | 1.0 mm |
| 20 | 6/3/22 | 28 | 13 | Neural Plate | 6 PM | 1.2 mm |
| 22 | 6/3/22 | 25 | 14.5 | Neural folds | 8 PM | 1.5 mm |
| 1.0 | 6/3/22 | 23 | 16 | Neural tube | 10 PM | 1.6 mm |
| 1.5 | 6/4/22 | 22 | 18 | Muscle Twitch | 10 AM | 2.8 mm |
| 2.5 | 6/5/22 | 23 | 20 | Gill circulation | 10 AM | 5.0 mm |
| 3.6 | 6/6/22 | 26 | 23.5-24 | Operculum partial>complete | 12 Noon | 7.0 mm |
| 6.75 | 6/9/22 | 30 | 25+ | Feeding | 4 PM | 8.2 mm |

* Early stages to feeding were from the normal table of development of *Lithobates* (formerly *Rana*) *pipiens* of Shumway (1940).

Cope's Gray Treefrog early embryos are brown above with smaller cells and are bottom-heavy from cream-colored, yolky, larger cells. After fertilization, they rotate inside the vitelline membrane, ensuring that the darker, brown-pigmented side faces the sun, allowing warming and acceleration of development (Figure 3). The eggs had been fertilized because they had started their rapid development, forming embryos with about 500 cells each. At the blastula stage (day 0.5), inside the embryo, there is an eccentric, fluid-filled cavity called the blastocoel. Essentially, at this stage, the spherical embryo has about 500 cells arranged in several layers of smaller brown cells on the roof of the blastocoel and a much smaller number of larger, yolk-filled cells beneath the blastocoel. By day 1, embryos had almost completed neurulation (Figure 4). By day 1.5, the embryos had developed extensively, forming a head (Figure 5) and tail. The bottom left embryo in Figure 5 has its head pointing up and its tail pointing down. The

embryos were also beginning to hatch from their encapsulating vitelline membranes but were still trapped in the loose jelly. When gently probed, they did not twitch, indicating that they had yet to form functional muscles. By day 3 (Figure 6), the embryos were twitching now and again; furthermore, by day 5, they had small rudimentary eyes and could swim vigorously, having freed themselves from the jelly (Figure 7). By day 6 (Figure 8), the eyes had black irises, and the tail fin was broader. External gills had formed on the side of the head and circulating red blood cells were evident in the gills, indicating that the heart was functional. By day 8 (Figure 9), the opercula covered the gills, the gut tube was partially formed, the mouth with small black teeth was now moving, indicating that the tadpoles were ready to feed and continue growing. They started feeding on boiled lettuce leaves and by day 11 (Figure 10), they had grown to 7.5 mm and the head was larger than on day 8. Once the larvae begin feeding, they grow much larger, but don't change their overall morphology much until they begin to sprout limbs. The larvae at day 28 (Figure 11) is 23-mm long mm long, but has yet to form hindlimb buds.

Figure 3. Day 0.5, 1.0 mm, X10 life size.

Figure 4. Day 1, 1.5 mm X10 life size.

Figure 5. Day 1.5, 2.2 mm, X10 life size.

Figure 6. Day 3, 3.0 mm, X10 life size.

Figure 7. Day 5, 5.0 mm, X10 life size.

Figure 8. Day 6, 5.5 mm, X10 life size.

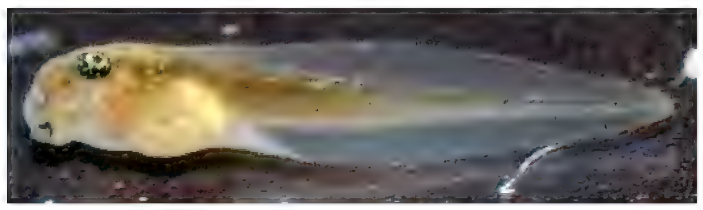


Figure 9. Day 8, 6.0 mm, X10 life size.

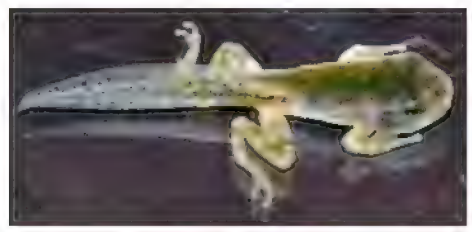
Figure 10. Day 11, 7.5 mm.

Figure 11. Day 28, 23 mm, 5X.

During the summer of 2022, I followed the limb development and metamorphosis of the tadpoles, using the stages described by Taylor and Kollros (1946) for *Lithobates pipiens*. Metamorphosis began on day 40, with the appearance of a minute hindlimb bud. By day 44, the larvae had 5.5 mm hindlimb buds with 5 digits but no forelimb buds (Figures 12 and 13). Metamorphosis of the aquatic larvae into terrestrial froglets continued until day 59, when it was completed (Figure 14). The results are summarized in Table 2. At 21-24 °C, the time from fertilization to metamorphosis was 54.1 +/- 3.6 s.d. days (N = 10, range 49-59 days). Ten metamorphosed froglets were released near their natal pond.

Figure 12. Day 44, 41.1 mm.

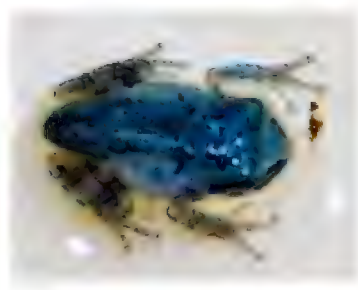
Figure 13. Day 44, Hindlimb, 20X.



Day 52, 34 mm

Day 53, 26 mm

Day 55, 23 mm



Day 57, 21 mm

Day 59, 18 mm

Figure 14. Cope's Gray Treefrog Metamorphosis.

Table 2. Extended Development of Cope's Gray Treefrog*

| Day | Date | T, °C | Stage | Notes | Time | Length |
|---|---|---|---|---|---|---|
| 0 | 5/14/22 | 24 | 0 | Uncleaved | 10 PM | 1.0 mm |
| 0.5 | 5/15/22 | 24 | 8 | Mid-blastula | 10 AM | 1.0 mm |
| 0.75 | 5/15/22 | 27 | 9 | Late blastula | 2 PM | 1.0 mm |
| 1.0 | 5/15/22 | 21 | 13 | Neural plate | 10 PM | 1.2 mm |
| 1.5 | 5/16/22 | 22 | 17 | Tail bud | 10 AM | 2.2 mm |
| 2 | 5/16/22 | 21 | 18 | Muscle response | 10 PM | 2.0 mm |
| 2.5 | 5/17/22 | 21 | 18 | Tail longer | 9 AM | 2.5 mm |
| 3 | 5/17/33 | 21 | 19 | Heart beat | 10 PM | 3.0 mm |
| 3.5 | 5/18/22 | 21 | 20 | Gill circulation | 10 AM | 4.0 mm |
| 4.5 | 5/19/22 | 21 | 21 | Mouth Open | 10 AM | 5.0 mm |
| 6.75 | 5/21/22 | 29 | 25 | Operculum complete | 4 PM | 6.0 mm |
| 12.50 | 5/27/22 | 20 | 25+ | Feeding | Noon | 10.0 mm |
| 28 | 6/11/22 | 22 | 25+ | Feeding, no limb buds | 2 PM | 21.0 mm |
| 44 | 6/27/22 | 24 | XII | 5-mm hindlimb, 5 digits | 11 AM | 41.1 mm |
| 51 | 7/4/22 | 22 | XX+ | Hind- and forelimbs, head more frog-like | 10 AM | 43.0 |
| 52 | 7/5/22 | 20 | XX+ | Tail resorption | 11 AM | 34.0 mm |
| 53 | 7/6/22 | 21 | XXI | Tail resorption | 11 AM | 26.0 mm |
| 55 | 7/8/22 | 22 | XXIII | Small Tail | 11 AM | 23.0 mm |
| 57 | 7/10/22 | 22 | XXIV | Tail nearly gone | 11 AM | 21.0 mm |
| 59 | 7/12/22 | 22 | XXV | No tail | 11 AM | 18.0 mm |

* Early stages to feeding (in Arabic numbers) were from the normal table of development of *Lithobates* (formerly *Rana*) *pipiens* of Shumway (1940). Stages of metamorphosis (in Roman numerals) were from Taylor and Kollros (1946).

## DISCUSSION

The Alexandria, Virginia the treefrog population is clearly Cope's Gray Treefrog (*Hyla chrysoscelis*) based on the spectrographic analysis of their calls. All calls heard from April through July 2022 were similar. No distinctive calls from the Gray Treefrog (*Hyla versicolor*) were heard. In most cases, *Hyla chrysoscelis* eggs were brown above and 1 mm in diameter. However, the June 2, 2022 spawning contained a few eggs that were smaller and more darkly pigmented than the rest of those in the clutch. These smaller eggs developed at the same rate as their larger siblings but formed smaller larvae. Cope's Gray Treefrog embryos and larvae develop quite synchronously, albeit with some variability in rate of development of larvae.

Like toads, Cope's Gray Treefrogs often lay their eggs in temporary rain ponds. Consequently, their development is quite rapid. For example, from the beginning of gastrulation (Stage 10) to the neural plate (Stage 13) was only 4 hours at 25-28 °C. In contrast, this process would take about 12 hours in the Leopard Frog (*Lithobates pipiens*). Cope's Gray Treefrog larvae began metamorphosis at 40 days at 21-24 °C., and they finish metamorphosis in only 54.1 +/- 3.6 s.d. days (N = 10, ranged 49 days-59 days). In contrast, in species that breed in

permanent bodies of water, e.g., Green Frogs (*Lithobates clamitans*), development from fertilization to metamorphosis takes 91 days (Johnson K.E., unpublished observations) on a year in the American Bullfrog (*Lithobates catesbeianus*).

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***Gastrophryne carolinensis* (Eastern Narrow-mouthed Toad).** VA: Campbell Co., Vic Thomas Fish Hatchery, (37.03108870, -78.92547606) 28 June 2022. Hannah Kinsley.

County Record: Eastern Narrow-mouthed Toads are nocturnal and secretive. These toads range from 22-38 mm, have smooth skin, pointed snout, and a distinct fold at the back of the neck. This species has predominantly been found along the coast and the southeast corner of the state. Here I report the first record for Campbell County.

On 28 June 2022 I was working in the fish hatchery building on location. The high temperature for the day was around 29$^0$C, about 15% cloud cover, and occasional breezes no higher than 5-10 kph. This building is located near six vernal pool type ponds and several small creeks. I was not actively searching for herps but happened to look down and see the toad. I captured the toad and obtained a digital photograph (VHS Archive #689) prior to the release of the animal.

**Hannah Kinsley**
Lynchburg, VA 24501

***Hyla gratiosa* (Barking Treefrog).** VA: Amelia County, Amelia Court House, 12671 Lodore Rd, 25 July, 2022, Michael Summers.

County Record: On 25 July 2022 I was watering my garden about 9 am when I noticed something floating in the bird bath I have near the garden. Upon closer examination it was a large treefrog. I obtained a digital photograph and sent it to the VHS identification page for confirmation and was informed it was a Barking Treefrog. There are records of Barking Treefrogs from 15 counties in southeastern Virginia, but no verified record for Amelia County. This then represents the first verified record for Amelia County, which extends the range a bit to the northwest of the previous distribution. A digital photograph was submitted to the VHS Archive (# 672) as a voucher for this observation.

**Michael Summers**
Amelia Court House, VA

***Hyla squirella (Squirrel Treefrog).*** VA: City of Franklin. Franklin Police Department, 1018 Pretlow St (36°39'50"N, 76°55'11"W). 18 August 2022. Mike Blythe and Amy Lehman.

City Record: The Squirrel Treefrog inhabits the Coastal Plain region of the state, with verified occurrences in 18 counties and 6 cities (VHS website). Here we report the first documented observation for the City of Franklin. We were searching for herpetofauna after sunset on the grounds of the Franklin Police Department when we observed four (4) Squirrel Treefrogs on the FPD sign. The sign (located in a strip of grass separating the parking lot and Pretlow Rd) is illuminated, attracting many insects that undoubtedly become prey for the frogs. We captured one of the frogs for photos and returned it to its original location. Photos were submitted to VHS to confirm the identification (VHS Archive #697). The Squirrel Treefrog has been verified in all surrounding localities (Southampton County, Isle of Wight County, and Suffolk), so this observation fills a gap in the species distribution. The weather for this observation was partly cloudy and 24°C.

**Amy Lehman**
Southampton County

***Hyla Squirella* (Squirrel Treefrog).** VA: Hanover Co., [lat./long. coordinates: 37.73858297227229, -77.50923946069173]. 22 June 2022. Amy Martin.

County Record: Amy Martin heard and recorded the calls of two male Squirrel Treefrogs in her yard during evening rain events, in Hanover County. She texted the recordings to Susan Watson, who was able to identify the species via the recorded calls. Additionally, Susan forwarded the recording to State Herpetologist, John (J.D.) Kleopfer, for confirmation, and he confirmed. This recording represents a new county record for Squirrel Treefrog in Hanover County. Mitchell and Reay (1999, Atlas of Amphibians and Reptiles in Virginia. Special Publication Number 1, Virginia Department of Game and Inland Fisheries [now Virginia Department of Wildlife Resources]) and the Virginia Department of Wildlife Resources' Species Observations (SppObs) Database (formerly known as Collections Database) (1991-2022) do not report any records of Squirrel Treefrog in Hanover County. Hanover County has been considered as a likely or potential locality for occurrences of this species, since the species has been documented in surrounding counties: King William, New Kent, and Henrico. This record represents a slight northwestern extension to the known range in Virginia. Amy's voucher recording was submitted as a voucher for this field note (Archive #665).

**Amy Martin, Susan Watson, and John (J.D.) Kleopfer**
Virginia Department of Wildlife Resources
7870 Villa Park Drive, P.O. Box 90778
Henrico, VA 23228
& 3801 John Tyler Memorial Hwy.
Charles City, VA 23030

***Lithobates clamitans* (Green Frog):** VA. City of Franklin, GMAX Industries, Inc., Pretlow Industrial Park, 221 Progress Pkwy (36°39'25" N, 76°55'37"W). 1 October, 2022. Mike Blythe and Amy Lehman.

City Record: The Green Frog is one of, if not the most ubiquitous of anurans in Virginia. It has been verified in 90 of the 95 counties in Virginia, and 18 cities. In those counties and cities in which there is no verified record, it is typically because the area has not had a thorough search. Franklin is an independent city in Hampton Roads. The VHS Database lists only two records of amphibians for the City of Franklin. Thus, any amphibians found there would help contribute information to their distribution. With this in mind, on the first of October we were searching for herpetofauna at Pretlow Industrial Park when we observed a small/subadult Green Frog swimming in a puddle of rainwater in a parking lot. The parking lot was situated between an industrial warehouse and a series of stormwater features (ditches and retention ponds), which separate the industrial park from agricultural fields. We captured the frog to take photos and released it at the same site. A photo was submitted to the VHS Archive (# 696) as a voucher for this record. The weather was cloudy and the temperature was 20°C.

**Amy Lehman**
Southampton County

***Lithobates kauffeldi* (*Mid-Atlantic Coast Leopard Frog*).** VA: City of Franklin. Franklin Business Center, 601 N Mechanic St (36°40'48"N, 76°55'24"W). 16 August 2022. Mike Blythe and Amy Lehman. City Record: The likely range for the Mid-Atlantic Coast Leopard Frog is limited to the Coastal Plain region of the state, with verified presence in 10 counties and 1 city (VHS website). Here we report the first documented observation for the City of Franklin. We were searching for herpetofauna after sunset in downtown Franklin when we observed a frog hopping across the parking lot at the Franklin Business Center. We captured the frog to take photos and released it at the same site. Photos were submitted to VHS to confirm the identification (VHS Archive #698)). The Mid-Atlantic Coast Leopard Frog has been verified in all surrounding localities (Southampton County, Isle of Wight County, and Suffolk), so this observation fills a gap in the species distribution. The weather for this observation was mostly cloudy and 19.5°C.

**Amy Lehman**
Southampton County

***Agkistrodon contortrix* (Eastern Copperhead):** VA, Tazewell County (37.067361, -81.672682) on Laurel Gap Road, 100 meters from Pounding Mill Road. 20 September 2022. Clancey Deel.

County Record: The Eastern Copperhead has a state-wide distribution with records from all but 5 of the 95 counties in Virginia (Grayson, Middlesex, Northumberland, Tazwell and Wythe). It is one of the three venomous snakes in Virginia. On 20 September 2022 I was driving on Laurel Gap Road, heading for a birding site, when I saw a Copperhead in the road, probably picking up heat from the dark asphalt. The weather was partly cloudy and about 13°C. I stopped and photographed the snake and sent the photograph to the VHS as a voucher (Archive #680) for this first record for Tazwell County. This record fills a gap in the distribution of the Copperhead for far western Virginia.

**Clancey Deel**
Richlands, VA

***Haldea striatula* (*Rough Earthsnake*).** VA: City of Franklin. Franklin Police Department, 1018 Pretlow St (36°39'50"N, 76°55'12"W). 18 August 2022. Mike Blythe and Amy Lehman.

City Record: The Rough Earthsnake has been verified in 10 counties and 4 cities within the Coastal Plain region of the state (VHS website). Here we report the first documented observation for the City of Franklin. We were searching for herpetofauna after sunset on the grounds of the Franklin Police Department when we observed a Rough Earthsnake on bare dirt beside a lamp post. The snake attempted to burrow into the surrounding grass when we approached. We captured the snake for photos and returned it to its original location. Photos were submitted to VHS to confirm the identification (VHS Archive #695). The Rough Earthsnake has been verified in only one adjacent locality (Southampton County), so this observation further informs the geographic distribution of the species. The weather for this observation was partly cloudy and 24°C.

**Amy Lehman**
Southampton County

***Haldea striatula* (Rough Earthsnake)** VA: Suffolk. White Marsh Road (36.718698, -76.565754). 15 March 2022. Myles Masterson, Dane Conley, Riley Corbin, and Holly Stoughton.

City Record: In Virginia, the Rough Earthsnake (*Haldea striatula*) is a relatively common species found throughout southeastern Virginia. It occupies a variety of habitats in the Piedmont and Coastal Plain ecoregions and is often found under ground cover objects (Kleopfer, J.D., J.C. Mitchell, M.J. Pinder, and S.H. Watson. 2017. A Guide to the Snakes and Lizards of Virginia. Special Publication Number 6, Virginia Department of Wildlife Resources. Richmond, VA. 72 pp.). On 15 March 2022, we found a Rough Earthsnake under artificial cover. Mitchell and Reay (1999, Atlas of Amphibians and Reptiles in Virginia. Special Publication Number 1,Virginia Department of Game and Inland Fisheries [now Virginia Department of Wildlife Resources]) and the Virginia Department of Wildlife Resources' Species Observations (SppObs) Database (formerly known as Collections Database) (1991-2022) do not report any records of Rough Earthsnake from the City of Suffolk. This is the first vouchered observation (VHS Archive #690) from this municipality and fills a hiatus in its distribution within the Commonwealth of Virginia.

**Myles Masterson**
Suffolk, VA

***Heterodon platyrhinos* (Eastern Hog-nosed Snake)** VA: Orange County, Locust Grove, 31465 Deep Meadow Rd. 29 July 2012. Melissa Kovach.

County Record: The Eastern Hog-nosed Snake is found in most of the eastern United States, and in 80 of the counties in Virginia (http://www.virginiaherpetologicalsociety.com/reptiles/snakes/eastern-hog-nosed-snake/eastern_hognose_snake.php Accessed 9 August 2022). However, it is not reported from Orange County. On 29 July 2012 our family saw and photographed a melanistic Hog-nosed Snake on the patio outside the residence of 31465 Deep Meadow Rd. in Locust Grove, Virginia. We have frequently seen what we presume is the same snake hunting toads on the patio over several years. We have also seen other individuals in the county, but this is the first time a photographic voucher was obtained. The photo (Archive #676) was sent to the VHS when I noticed there was no record for Orange County.

**Melissa Kovach**
Locust Grove, VA

***Lampropeltis elapsoides* (Scarlet Kingsnake)** VA: Charlotte County. 26 March 2020. Corbin Meadowbourne, Myles Masterson, and J.D. Kleopfer

County Record: In Virginia, the Scarlet Kingsnake (*Lampropeltis elapsoides*) is known to occur from the east slope of the southern Blue Ridge Mountains through southeastern Virginia with several gaps in its distribution. In a snake identification group on Facebook, Corbin Meadowbourne posted a photo of a Scarlet Kingsnake. Myles Masterson contacted Mr. Meadowbourne and was informed that it was found on his family farm in Red Oak, Virginia. The Virginia Department of Wildlife Resources' Species Observations (SppObs) Database (formerly known as Collections Database) (1991-2022) does not report any records of Scarlet Kingsnake from Charlotte County. This is the first vouchered observation (VHS Archive #691) of this species from this municipality and fills a hiatus in its range within the Commonwealth of Virginia. At the request of the landowner, exact locality information is intentionally withheld.

**Myles Masterson**
Suffolk, VA

***Lampropeltis elapsoides* (Scarlet Kingsnake)** VA: Suffolk. 28 April 2021. Myles Masterson and John (J.D.) Kleopfer.

City Record: Although the Scarlet Kingsnake (*Lampropeltis elapsoides*) has a relatively broad range in Virginia, extending from the eastern slope of the southern Blue Ridge Mountains to southeastern Virginia, there are numerous gaps in its distribution. On 28 April 2021, a neighbor of co-author Myles Masterson reported finding a snake in his backyard. Upon further investigation, the animal was identified as a Scarlet Kingsnake by co-author Myles Masterson. The snake measured 635 mm (25 inches) in total length. The Virginia Department of Wildlife Resources' Species Observations (SppObs) Database (formerly known as Collections Database) (1991-2022) does not report any records of Scarlet Kingsnake from the City of Suffolk. This is the first observation (VHS Archive #692) reported from this municipality and fills a hiatus in its range within the Commonwealth of Virginia. Exact locality information intentionally withheld due to collection pressure.

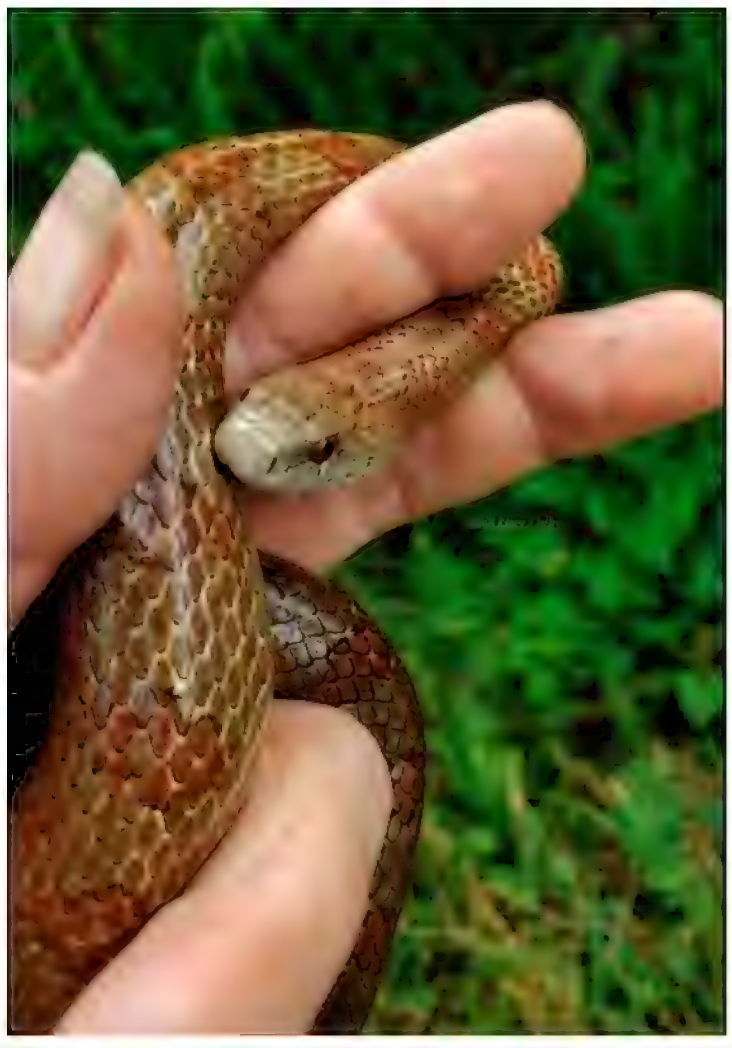
**Myles Masterson**

Suffolk, VA

***Lampropeltis rhombomaculata* (Mole Kingsnake)**: VA. Orange County, County Route 738 50 m from Route 20. 26 May 2018. Lucy Colby.

County Record: The Mole Kingsnake is found in the Coastal Plain and Piedmont in Virginia. Because of their fossorial nature they may not be commonly observed even when in the area. On 26 May 2018 I saw a snake near the intersection of County Routes 738 and 20. There was underbrush on one side of the road and a lawn on the other. I identified the snake as a Mole Kingsnake and sent the photo to the VHS. I had seen another Mole Kingsnake on 4 April 2013 and another on 5 October 2021, also on Route 738, so the species has been known in the area for some time but never reported. When I was informed this was the first time the species was verified in Orange County, I submitted the photograph as a voucher (VHS Archive #699). The Mole Kingsnake has been verified in all surrounding counties, so this report fills a gap in the Piedmont distribution.

**Lucy Colby**



***Lampropeltis rhombomaculata* (Mole Kingsnke)**: VA. Orange County, 29211 Old Office Road, Rhoadesville. 9 October 2022. Rebecca Rollins

Confirmation of County Record: The Mole Kingsnake has a wide distribution in the Coastal Plain and Piedmont of Virginia. Because of their fossorial nature, they are not commonly seen, although they may be prevalent in an area. They have been reported in most counties east of the Blue Ridge Mountains (VHS Website, https://www.virginiaherpetologicalsociety.com/reptiles/snakes/mole-kingsnake/mole_kingsnake.php) and only recently in Orange County (Colby, 2022 *Lampropeltis rhombomaculata*, Orange County record. Catesbeiana 42(2):p64). The current specimen is a juvenile and was found as a road kill in the driveway of Rebecca Rollins at 29211 Old Office Road, in Rhoadesville. The specimen was found on 9 October 2022. The weather was sunny and 18°C. A digital photo was provided to the VHS (Archive #687) as a voucher.

**Kattie Hooser**

***Nerodia sipedon sipedon* (Northern Watersnake)** VA: City of Fairfax, Daniels Run Park (38°50'59.5"N 77°16'46.4"W). 9 September 2022. Matthew Anthony and Erin C. Anthony.

City Record: A juvenile Northern Watersnake was on the footpath along the boundary fence. This snake likely hatched this season due to its size. The park is a forest fragment surrounded by urban development with a stream running through it and a retention pond directly adjacent. It is likely a refuge for many generalist species in the vicinity. The snake was initially spotted by Matthew Anthony and identified by Erin C. Anthony. A digital photograph was submitted as a voucher (Archive #681) for this new city record.

**Erin C. Anthony**
Post Oak Middle School
Science Department
Spotsylvania, VA 22553

***Nerodia sipedon* (Northern Watersnake).** VA: Mathews County, Field at 6293 New Point Comfort Hwy Susan. 7 July 2022. Amanda Pugh.

County Record: The Northern Watersnake has a wide distribution throughout the northeastern quarter of the United Sates. In Virginia it is verified in all counties except Orange and Mathews. I report here, the first record of a Northern Watersnake in Mathews County. On 7 July 2022 I was walking my dog along a ditch at 6293 New Point Comfort Hwy near Susan when I saw and photographed a Northern Watersnake. The "ditch" that is often a mix of saltwater from a small gut off Horn Harbor. It's truly more the very start of the gut itself. It was towards the evening and the weather has been hot and sunny. I sent a copy of the digital photograph to the VHS as a voucher for the observation (VHS Archive # 667). With Robins-Johnson (2022. Nerodia sipedon new record for Orange County, Catesbeiana 42(2):66) the Northern Watersnake becomes the first herp for which there is a vouchered record in every county in Virginia.

**Amanda Pugh**
Susan, VA

***Nerodia sipedon* (Northern Watersnake)** VA: Orange County, Small pond off U.S. Route 3, Germanna Highway and Lake of the Woods Way. 18 June 2022. Jessica Robbins-Johnson.

County Record: The Northern Watersnake has a state-wide distribution with verified records in all but Mathews and Orange Counties (https://www.virginiaherpetologicalsociety.com/reptiles/snakes/northern-watersnake/northern_watersnake.php, accessed 27 July 2022). Here, I report the first record for Orange County. On 18 June 2022 I observed a Northern Watersnake attracted to small bluegill and bass being tossed back into the water of a small pond off U.S. Route 3 during a neighborhood fishing tournament for children. The snake was probably looking for an easy meal. I was able to pick it up, show her off to the children and release it without being bit. I frequently encounter *Nerodia* in my neighborhood that includes 2 lakes and part of Keaton's Run as well as the nearby Rapidan River. On this date I obtained several photos of the snake prior to its release, which were submitted to the VHS Archive (# 671) as a voucher for the new county record. Together with Pugh (2022. Nerodia sipedon Mathews County Record, Catesbeiana 42(2): 65) the Northern Watersnake is now the first herp with a verified record in every county within Virginia.

**Jessica Robbins-Johnson**
Locust Grove, VA

**Nerodia Sipedon (Northern Watersnake)** VA: Montgomery County, Caboose Road (private residence). 4 July 2022. Tiffany Williams.

Amelanism: Coloration in snakes is created by the production and distribution of pigments made by cells called chromatophores. The major chromatophores in snakeskin include the melanophores, xanthophores and erythrophores. Melanophores produce a pigment which can be black, brown, or yellow color pigment. Xanthophores produce a yellow pigment and erythrophore pigments are red. Iridophores do not produce color pigments but produce nanocrystals of guanines which have light reflecting properties and give an iridescence to the overall color appearance. The distribution and concentration of these chromatophores create various patterns which aid in camouflage or aposematic (warning) coloration. Amelanism is a color

anomaly created when an animal does not produce the pigment melanin in the skin or eyes. The lack of melanin will produce an animal which has pink eyes, no brown/black pigment, but does retain the colors produced by the other pigment producing cells. In captive bred corn snakes, a mutated OCA2 gene (oculocutaneous albinism II gene) has been implicated as the cause of the amelanism (Saenko, S.V., L. Sangeet, A. Martinez Barrio, N. Rafati, L. Andersson, and M.C. Milinkovitch. 2015. Amelanism in the corn snake is associated with the insertion of an LTR-retrotransposon in the OCA2 gene. Scientific reports 5(1): 1-9). When this gene is mutated, it does not allow melanocytes to produce melanin, leaving the snake to be colored by the remaining functional chromatophores. The purpose of this field note is to report an amelanistic Northern Watersnake found in Montgomery County Virginia.

On 4 July, a juvenile Northern Watersnake was found submerged in a small creek at a private residence in Montgomery County. The snake was at least one year old and exhibited an amelanistic color anomaly pattern. There was no brown or black coloration in the eyes or skin of this snake. The snake appeared to be healthy. A snake similar in color pattern to this observation was made at James River State Park during a spring VHS survey on the weekend of 17-18 May 2014. Sattler and Gibson (2014. A herpetological survey of James River State Park. Catesbeiana 36(1): 21-34) reported the snake as being albino, however the snake they observed did have red color patterns and perhaps should have been classified as amelanistic. We encourage all VHS members to report any unusual color anomalies observed in wild herps caught in Virginia. A digital photo has been deposited in the VHS Digital Archive (# 685) to document this observation.

**Jason D. Gibson**
Patrick & Henry Community College
Biology Department
645 Patriot Avenue
Martinsville, VA 24112

**Tiffany Williams**
Caboose Road
Christiansburg VA

***Opheodrys aestivus* (Rough Greensnake):** VA. 372 Wily the Creek Road, Poquoson City (Lat 37.11 Long -76.39). 15 May 2020. Nick Sykes.

City Record: Poquoson is an independent city just southeast of York County on the east coast of Virginia. The Rough Greensnake is an arboreal insectivorous snake with a state-wide distribution. It has been verified in 84 counties and 14 cities, but not until now in Poquoson (VHS webpage. https://www.virginiaherpetologicalsociety.com/reptiles/snakes/rough-green-snake/rough_greensnake.php). On 15 May 2020 I was sitting in my car eating lunch in a small business park with some wooded areas bordering a marsh. I noticed something moving in the bushes near me. It was a Rough Greensnake. I obtained some photos and sent one to the VHS Identification Page for verification (VHS Archive # 687). This observation is the first record for the City of Poquoson. The Rough Greensnake is found in all surrounding cities and counties so the observation is not unexpected.

**Nick Sykes**
Poquoson, VA

***Pantherophis guttatus* (Red Cornsnake)** VA: Charlotte County. October 2019. Corbin Meadowbourne and Myles Masterson.

County Record: On an unspecified day in October of 2019, Corbin Meadowbourne provided Myles Masterson a photograph of a Red Cornsnake, which he had found on his family farm in Charlotte County. Mitchell and Reay (1999, Atlas of Amphibians and Reptiles in Virginia. Special Publication Number 1, Virginia Department of Game and Inland Fisheries [now Virginia Department of Wildlife Resources]) and the Virginia Department of Wildlife Resources' Species Observations (SppObs) Database (formerly known as Collections Database) (1991-2022) do not report any records of Red Cornsnake from Charlotte County. This is the first observation (VHS Archive #693) reported for this municipality and fills a hiatus in its distribution within the Commonwealth of Virginia. Exact location intentionally withheld by landowner request.

**Myles Masterson**
Suffolk, VA

***Regina septemvittata* (Queen Snake):** VA. Spotsylvania County, north of Lake Anna (38.136697, -77.932005). 25 June 2022. Philip Dunning.

County Record: The Queen Snake is widely distributed, occurring in many of the counties in central and western Virginia. They are found in rocky streams where they find cover and freshly molted crayfish, which make up most of their diet (Mitchell, J.C. 1994. The Reptiles of Virginia. Smithsonian Institution Press, Washington, D.C. 352pp.). They may be locally abundant if the habitat is good (Salotti, M. and D.A. Perry. 2019. Herpetological Survey of Natural Bridge Park 11 and 12 June 2016. Catesbeiana 39(1):15-25).

On 25 June 2022 I opened the patio door on the house we were renting while on vacation, and my daughter Alexis noticed a small snake slithering across the patio. I recognized the snake as a Queen Snake. This is the first report of the Queen Snake from Spotsylvania County, although it is known from Caroline County to the east and Culpeper and Stafford Counties to the north. It was not found during the VHS survey at Lake Anna in 2018(Neff, M. Virginia Herpetological Society 2018 Annual Spring Survey, Lake Anna State Park in Spotsylvania County. Catesbeiana 39(2):82-96). I presume the snake was from Lake Anna as there were no streams visible nearby. A digital photo of the snake was submitted to the VHS Archive (# 664) as a voucher for this observation.

**Phil Dunning**
Senior Herpetologist
WHM Consulting, LLC
Wellsboro, Pennsylvania

***Regina septemvittata* (Queensnake)** VA: Wythe Co., 394 Cherry Lane, Ivanhoe. (36.82194° N, 80.96805° W). 31 August 2022. Sierra Stephens.

County Record: I observed and photographed a Queensnake (*Regina septemvittata*) in a residential area in Ivanhoe, Virginia. The Queensnake had entered my residence on 31 August 2022. The snake was quickly captured, photographed, and safely released about 100 m north of the residence along Powdermill Branch, a first-order tributary of the New River.

Although it is found in surrounding counties (Bland, Pulaski, Smyth, Grayson), this is the first confirmed report in Wythe County. It is likely that this species is not new to the county and could be found in suitable habitats. A digital photograph was submitted to the VHS Archive (#684) as a voucher for the observation.

**Sierra Stephens**
Radford University
Department of Biology
Radford VA 24142

***Storeria dekayi* (Dekay's Brownsnake).**VA: Fauquier Co., Bull Run Natural Area Preserve (38° 54' 48.9924", -77° 40' 38.3232"). 24 April 2022 & 16 June 2022. Lauren Fuchs and Erica Lyon

County record: *S. dekayi*, commonly known as Dekay's Brownsnake, is a small terrestrial colubrid snake species broadly distributed throughout the eastern United States (Christman, 1982, Catalogue of American Amphibians and Reptiles, *Storeria dekayi* 306.1pp.; and Hecnar & Hecnar 2011, Microhabitat Selection of Woody Debris by Dekay's Brownsnake (*Storeria dekayi*) in a Dune Habitat in Ontario, Canada. *Journal of Herpetology*, *45*(4), 478–483). In Virginia, the species has been verified in 56 counties and 15 cities, including several counties adjacent to Fauquier (Loudon, Prince William, Stafford; (Virginia Herpetological Society Website 2022, and Mitchell J.C. 1994, The Reptiles of Virginia Smithsonian Institution Press, 352 pp.). In April and June of 2022, we captured, sampled, and photographed two individuals of the species within the Virginia Outdoors Foundation's (VOF) Bull Run Mountains Natural Area Preserve. VOF's Preserve at Bull Run Mountains is a state-designated Natural Area Preserve located in Virginia's northern Piedmont region. This natural land holding has 10 different distinct habitat types across 2,500 acres that spread across both Prince William and Fauquier counties. As part of an ongoing disease monitoring project, we have been sampling colubrid snakes across VOF's Preserve (since October 2021). To date, opportunistic searches have produced 36 individuals across eight different colubrid species, including two independent encounters with *Storeria dekayi*. Both observations of this species occurred in the Preserve's northern section, at a site located within the Fauquier County limits. To the best of our knowledge, this is the first formal documentation of the species in the county of Fauquier, however, there has been one additional observation in the county reported on iNaturalist posted March 19, 2022. The first encounter took place on April 24, 2022. The weather was sunny with a high temperature of 84 degrees Fahrenheit. We found the snake beneath a large sheet of tin roofing, (which had been deliberately set out as a coverboard several weeks prior). This finding coincides with other reports that recognize coverboards as a common microhabitat selection for *S. dekayi* (Hecnar & Hecnar 2011; and Powell, R., et al. 2016. *Peterson field guide to reptiles and amphibians of Eastern and Central North America*.). We carefully inspected the snake for any apparent signs of dermatitis (none were visible), then collected a swab sample of the skin to be later assayed for the presence of the mycotic pathogen, *Ophidiomyces*

*ophiodiicola*. We measured the snake's total length (19.5 cm), snout-to-vent (S-V) length (14.5 cm), and circumference (2.5 cm). Based on the absence of a cream/yellow collar, we determined this individual to be an adult, however we were unable to verify sex. We then photographed the snake, which helps us identify and limit resampling of conspecifics.

We observed the second *S. dekayi* on June 16, 2022. The weather was sunny with a high temperature of 88 degrees Fahrenheit. We also found this snake under another tin coverboard in the same general vicinity as the first, but established that it was not the same individual based on differences in size, coloration, and dorsal pattern (parallel rows of dots connected by light horizontal bands). Upon inspection, we noticed a small patch of crusty, discolored scales. We collected a skin swab sample, measured (29 cm/23 cm/3.5 cm) and photographed the snake (VHS Archive #673). Again, we determined the snake to be an adult based on the absence of a collar.

Despite the species' abundant and extensive presence throughout much of the eastern United States, loss of the snakes' preferred habitats, along with reduced food sources due to pesticide use is suspected in the apparent decline of many of Virginia's *S. dekayi* populations (Virginia Herpetological Society Website, 2022. https://www.virginiaherpetologicalsociety.com/reptiles/snakes/brownsnake/brownsnake.php). It is therefore important that current and newly identified populations continue to be monitored, alongside considerations for potential management strategies.

**Lauren Fuchs, Erica Lyon, & Joe Villari**
Virginia Outdoors Foundation
39 Garrett Street, Warrenton Virginia 20186

***Storeria occipitomaculata*** **(Red-bellied Snake):** VA. Rappahannock County, 30 Hungry Horse Ln, Sperryville. 14 March 2022. Robert Bannister.

County Record: The Red-bellied Snake is a small secretive snake rarely seen by casual observations. They are nocturnal and usually under various cover objects by day. Their primary prey is slugs. On 14 March 2022 I was clearing leaves from plants in my backyard when I discovered a small snake. I took several digital photographs and sent them to the VHS Identification page. I was informed the snake was a Red-bellied Snake and there was no previous record for Rappahannock County. I submitter a photo voucher (Archive #679) to document this new record for Rappahannock County which helps fill a gap in the distribution in northern Virginia. According to Mitchell (1994. The Reptiles of Virginia. Smithsonian Institution Press, Washington DC. 352pp.) the earliest date of activity based on museum records is 18 March, so this observation moves back that earliest activity by a few days.

**Robert Bannister**
Sperryville, VA

***Storeria occipitomaculata*** **(Red-bellied Snake)**: VA. Rappahannock County, 147 Thornton Gap Ch Road, Sperryville. 25 September 2022. Bradley D. Fowler.

Confirmation of County Record: The Red-bellied Snake, because it is small and nocturnal, is not often seen unless one is overturning rocks, logs, or other cover objects by day. They have a state-wide distribution although there are few records in far southwestern Virginia. Until recently, there were no records for Rappahannock County. Bannister (see previous Field Note: Bannister, R. 2022. Field Note Storeria occipitomaculata. Catesbeiana 42(2): X) reported the first observation in March of 2022. Here, I confirm that report with an additional observation on 25 September of this year. When working in a wood pile, Bradley Fowler notified me he found and photographed a Red-bellied Snake. A digital photo (Archive #683) was submitted as a voucher to support the presence of Red-bellied Snakes in Rappahannock County.

**James Halpern**

***Thamnophis saurita saurita* (Common Ribbonsnake)** VA: Fauquier County, Clifton Institute, 6712 Blantyre Road, Warrenton, north of main office just before Adams Woods Loop trail. 23 July 2022. Patrick Warmsley.

County Record: On 23 July 2022 I was part of a butterfly survey at the Clifton Institute in Fauquier County. It was a sunny and very warm day. The Clifton Institute consists of 364 hectares protected under a conservation easement with programs in education, restoration and research. They have a box turtle mark/recapture program with more than 100 animals currently marked. The butterfly survey started at the office and walked north. Near the Adams Woods Loop trail we spotted, and I photographed a Common Ribbonsnake.

The Ribbonsnake is a Virginia Wildlife Plan tier IVa species indicating moderate conservation need, for which management plans or actions exit and can be implemented, if the snake's presence is known. While the Ribbonsnake has been documented in Loudoun and Fairfax Counties to the north, and Warren and Culpeper Counties to the west, there has not been a record for Fauquier County until now. The digital photograph was submitted to the VHS Archive (# 674) as a voucher for this observation and helps fill a gap in the distribution in northern Virginia.

**Patrick Wamsley**

***Chelydra serpentina* (Common Snapping Turtle).** VA: Mathews County, Field at 6293 New Point Comfort Hwy, Susan. 7 July 2022. Amanda Pugh.

County Record: The Common Snapping Turtle has a wide distribution in the eastern United States, and also in Virginia with verified records in 89 of the 95 counties. One of the few gaps in the Virginia distribution is in the eastern counties of Matthews, Gloucester, Middlesex and Lancaster Counties (Virginia Fish and Wildlife Information System, accessed 18 July, 2022). Here I report a record from Matthews County. On 7 July 2022 I was walking in a field at 6293 New Point Comfort Highway near Susan, when I saw and photographed a Common Snapping Turtle in a water-filled ditch. I have often encountered them here while walking in the past. They have also been seen by myself and family members across the county for years, however, apparently no one has ever obtained a voucher and reported them previously. The weather was hot and sunny. The digital photograph was submitted to the VHS Archive (# 666) as a voucher for this new county record.

**Amanda Pugh**
Susan, VA

***Chrysemys picta*** **(Eastern Painted Turtle)** VA: Carroll County, on the Blue Ridge Parkway near Fancy Gap (36.6710000, -80.6263000). 8 August 2022. Lauren Peery.

County Record: The Eastern Painted Turtle has a wide distribution in the eastern United States, and in most areas within Virginia (http://www.virginiaherpetologicalsociety.com/reptiles/turtles/eastern-painted-turtle/eastern_painted_turtle.php accessed 9 August 2022) There are still 14 counties without a record, mostly in the southwestern portion of the state, possibly due to a lack of searches and the few larger bodies of water in this region. On 8 August 2022 I was driving on the Blue Ridge Parkway near Fancy Gap when I saw an Eastern Painted Turtle crossing the road. I took a digital photograph of the animal prior to moving it to the far side of the road, apparently a female searching for a nesting site. Since this turtle has not been previously reported for Carroll County, I sent the photo (Archive #675) to the VHS as a voucher. This report helps to complete its distribution in far southwestern Virginia.

**Lauren Peery**
Laurel Fork, VA

***Chrysemys picta picta*** **(Eastern Painted Turtle)** VA: Stafford Co., Widewater State Park (38°24'31.2"N 77°19'02.1"W). 11 June 2022. Caroline Seitz, Patrick Wamsley, Emmett Lebendig, Sean Bender-Prouty, Amy Lehman, Mike Blythe, Sophie Larson, Jon Larson, Jon Kerr, Dave Perry, Erin C. Anthony

County Record: This individual was spotted sunning on a log in the inlet next to upland forest where the trail ran alongside the inlet. A survey group with the Virginia Herpetological Society observed it, and Patrick Wamsley photographed it (VHS Archive #682) before it slipped into the water. Stafford is lacking records of many freshwater turtles, and this seems to be a factor of under surveying. It is recommended that turtle trapping be done in Stafford County to fill in range gaps of freshwater turtles.

**Erin C. Anthony**
Post Oak Middle School
Science Department
Spotsylvania, VA 22553

***Chrysemys picta picta* (Eastern Painted Turtle)**. VA: Lunenburg County. Upper Lunenburg Beach Reservoir (36.9904946, -78.21260615). 4 Nov 2022. C. Michael Stinson.

Confirmation of County Record: A recent review of the range map for the Eastern Painted Turtle on the website of the Virginia Herpetological Society (VHS; https://www.virginiaherpetologicalsociety.com/reptiles/turtles/eastern-painted-turtle/eastern_painted_turtle.php accessed 4 Nov 2022) indicated the lack of a record for that turtle in Lunenburg County. Similarly, the Virginia DWR's Fish and Wildlife Information Service website indicated that the species was likely to occur in Lunenburg, but was not "known" to do so (https://vafwis.dgif.virginia.gov/fwis/booklet.html?Menu=_.Occurrence&bova=030060&version=19301 accessed 4 Nov 2022). This seemed surprising since Painted Turtles are common in much of Virginia and according to the VHS map have been documented in all counties adjacent to Lunenburg. In order to document the occurrence of the species in the county for VHS records, a recent image of an Eastern Painted Turtle taken at Lunenburg Beach Reservoir in Victoria (VHS Archive #701) is included with this note. The turtle was photographed in the early afternoon while basking on a limb of a partially submerged dead tree in the upper (southwest) end of the lake, a typical behavior for the species. Distinguishing features of the turtle that can be seen in the image include two yellowish crossbands on the carapace bordering the transverse seams of the scutes as well as round red spots on the marginals. Another individual of the same species was basking nearby on the same dead tree. According to VertNet, a specimen from Lunenburg identified as *Chrysemys picta* (no subspecific identification given) is part of the North Carolina Museum of Natural Sciences collection (NCSM-Herp 69649: Record ID: FCEE06A7-878F-4407-A570-C747A0FF5BEB; http://portal.vertnet.org/o/ncsm/ncsm-herp?id=fcee06a7-878f-4407-a570-c747a0ff5beb accessed 4 Nov 2022) but I have not examined it. Reports of the species from Lunenburg County can also be found on citizen science websites such as iNaturalist (e.g. https://www.inaturalist.org/observations/61244008 from 29 Sept 2020, from the same location as this report). Given the frequent occurrence of Eastern Painted Turtles in this part of Virginia, the observation reported here should not be considered an unexpected distributional record; it is simply being submitted to fill the lacuna in the map shown on the VHS website. Although the date of this observation might seem slightly late in the year, Painted Turtles are known to bask occasionally even on warm midwinter days, and the day on which this turtle was photographed was warm (22-23 °C) and mostly sunny, and several other turtles were also seen basking at the same site.

**C. Michael Stinson**
437 Wildflower Lane
Dillwyn, VA 23936

***Clemmys guttata* (Spotted Turtle)** VA: Spotsylvania Co., (location withheld). 16 August 2022. Erica Lyon and Lauren Fuchs.

County Record: On August 16th, 2022 at 12:16 p.m. an adult spotted turtle was observed in Spotsylvania County, Virginia. The turtle was found basking in a shallow puddle within forested habitat approximately 50 yards from a small creek, and adjacent to a large open cattle field. Based on its brown eye color and a slightly concave plastron, the turtle was determined to be a male.

On the day of observation, the weather was sunny with a temperature of 27°C at the time of sighting. A digital photograph of the animal(VHS Archive #677) was submitted to the VHS archive as a voucher. After taking several photos, the turtle was returned to the precise location from which it was found.

Spotted turtles are verified in 40 counties and 8 cities in Virginia including three counties adjacent to Spotsylvania, (Stafford Co., Hanover Co., and Louisa Co.; Mitchell J.C. and K.K. Reay 1999, Atlas of Amphibians and Reptiles in Virginia, VHS website). This observation thus fills a gap in the distribution of this species. The population biology and status of this species in Virginia is unknown. Population decline and local extirpation is largely due to loss of habitat from wetland destruction. In addition to habitat loss, the number of native species lost to the pet trade is unknown. Due to these threats more information about spotted turtle distribution and habitat in Virginia is needed to aid in conservation and protection of this species (VHS website).

**Erica Lyon, Lauren Fuchs**
Richmond, VA, Washington D.C.

***Pseudemys rubriventris* (Northern Red-bellied Cooter):** VA: Orange County, Lake of the Woods off Riverdale Lane, Locust Grove. 23 May 2021. Jessica Robbins-Johnson.

County Record: The Northern Red-bellied Cooter has a spotty distribution throughout eastern Virginia (http://www.virginiaherpetologicalsociety.com/reptiles/turtles/northern-red-bellied-cooter/northern_red-bellied_cooter.php, accessed 22 July 2022) . On 20 July 2022 our family was fishing at the Marina on the north end of Lake of the Woods in northeastern Orange County when we noticed a turtle swimming up to us as if begging for food. Other individuals were observed but this male came in closer than the others. We scooped up the turtle in a fishing net and took some photographs before releasing it back into the lake. Several of the photographs were sent to the VHS identification page to confirm the species as a Northern Red-bellied Cooter. We were then informed that there was no verified record for Orange County. The Northern Red-bellied Cooter is confirmed from Greene County to the west and Caroline and Spotsylvania Counties to

the east, so this record helps fill a gap in the distribution in northern Virginia. Digital photographs (Archive #670) were submitted as a voucher for the record.

**Jessica Robbins-Johnson**
Locust Grove, VA

***Trachemys scripta elegans* (Red-eared Slider)** VA: Orange County, Lake of the Woods off Riverdale Lane, Locust Grove. 23 May 2021. Jessica Robbins-Johnson.

County Record: The Red-eared Slider has a spotty distribution throughout Virginia (http://www.virginiaherpetologicalsociety.com/reptiles/turtles/northern-red-bellied-cooter/northern_red-bellied_cooter.php, accessed 22 July 2022) where it has been released as a result of the pet trade. They are not native to Virginia but are "naturalized" with breeding populations found in many ponds and lakes. Our family has seen these sliders in Lake of the Woods in northeastern Orange County for some time. Photographs of one individual was obtained on 23 May 2021 and another more recently on 22 April 2022. The photographs were sent to the VHS identification page to confirm the species as a Red-eared Slider. We were then informed that there was no verified record for Orange County.

The Red-eared Slider is confirmed only from Spotsylvania County to the east, so this record helps fill a gap in the distribution in northern Virginia. Digital photographs (Archive #669) were submitted as a voucher for the record.

**Jessica Robbins-Johnson**
Locust Grove, VA

***Sternotherus odoratus* (Eastern Musk Turtle)** VA: Orange County, Keaton's Run below Veterans Memorial Dam on Lake of the Woods off Riverdale Lane, Locust Grove. 23 May 2021. Jessica Robbins-Johnson.

County Record: The Eastern Musk Turtle has a state-wide distribution in Virginia (http://www.virginiaherpetologicalsociety.com/reptiles/turtles/northern-red-bellied-cooter/northern_red-bellied_cooter.php, accessed 22 July 2022) being found primarily in streams in every physiographic province and 65 of the 95 counties. There are gaps in this distribution, Orange County being one of them. On 23 May 2021 our family found and photographed several from Keaton's Run, below the Veterans Memorial Dam on Lake of the Woods north of Locust Grove in northeastern Orange County. Photographs

were sent to the VHS identification page to confirm the species as Musk Turtles. We were then informed that there was no verified record for Orange County. The Eastern Musk Turtle is confirmed from Spotsylvania County to the east, and Greene County to the northwest, so this record helps fill a gap in the distribution in northern Virginia. Digital photographs (Archive #668) were submitted to the VHS as a voucher for the record.

**Jessica Robbins-Johnson**
Locust Grove, VA

***Hemidactylus turcicus* (Mediterranean Gecko)** VA. Botetourt County, 10791 Lee Highway Fincastle. 15 November 2022. Shawn Conner

New County Record: The Mediterranean Gecko is native to the Mediterranean area of the old world; however, they have been introduced to the United States "hitch-hiking" in various types of packing crates. In Virginia, they have been reported from seven counties and twelve cities. They live exclusively in buildings, typically in dark and damp areas, and cannot survive outside in the winter. On 15 November 2022 my daughter called to tell me she found a lizard in our guest bathroom. I went up to find a baby gecko on the bathroom floor. The temperature was in the 40's. It wasn't moving much. I photographed the lizard and looked on the VHS Website to identify it. When I saw the Mediterranean Gecko had not yet been reported from Botetourt County, I sent in the photo (VHS Archive #700) with the request that Botetourt County be added to the verified counties.

**Shawn Conner**
Fincastle, VA

***Hemidactylus turcicus* (Mediterranean Gecko)**: VA, Petersburg, 219 East Bank Street. 29 July 2022. Shelly Gresham.

City Record: In the early evening on July 29, 2022, it was raining fairly hard, and the rain was hitting the window. I noted something on the window. I thought it was a leaf but upon further inspection, I discovered it was a small, translucent bodied lizard. I had my sister, Candace Duncan (a science teacher), on the phone and she was surprised it was on the glass! She told me to catch it, that must be a pet knowing that geckos are good on glass. I managed to carefully open the

window and catch it. I took it to her so we could investigate further. She visited the Virginia Herpetological Society webpage and, lo and behold, it looked like a Mediterranean gecko, which are in the southern US including Virginia. We had no idea and learned something new. I brought the gecko home and released it back onto the side of the building and took a digital photograph of it.

Mediterranean Geckos are native to the Mediterranean area but have been introduced into the United States. They live in buildings, usually in dark and damp areas. They feed on insects inside the buildings, and sometimes wander outside to feed at night. They are spread by humans with the adults or eggs accidently transported in moving households, or by nurseries transporting plants across the country. In Virginia, they have been reported in seven counties and twelve cities, and now Petersburg (https://www.virginiaherpetologicalsociety.com/reptiles/lizards/mediterranean-gecko/mediterranean_gecko.php). A digital photograph was submitted to the VHS Archive (# 678) as a voucher for this record.

**Shelly Gresham**
Petersburg, VA

***Scincella lateralis* (Little Brown Skink):** VA. Orange County 308 Liberty Boulevard, Locust Grove Lake of the Woods 16 September 2022. R. Marc Fast.

County Record: The Little Brown Skink has a state-wide distribution, although it is most commonly found in the southeastern portion of Virginia. There are few records in northern or western Virginia. Here, I report the first observation of a Little Brown Skink from Orange County. I was removing the remains of a tree stump in my front yard when I found a specimen. It was captured and photographed. I have actually found several of these in my 25 years in Locust Grove, but never bothered to obtain a photograph. I sent a copy of the digital photograph to the VHS Identification page as a voucher (Archive #686). This record helps fill a gap in the distribution.

**R Marc Fast**
Locust Grove, VA

***Tarentola mauritanica* (Moorish Gecko).** VA: Virginia Beach. New River Taphouse on Pleasure House Rd. 36.89736063147166, -76.1379732254215. 18 June 2020. Myles Masterson, Riley Corbin, Holly Stoughton, and John (J.D.) Kleopfer.

City Record: The temperate Moorish Gecko (*Tarentola mauritanica*) is native to the Mediterranean basin but has established alien populations in multiple localities throughout the world (Iolanda Silva-Rocha, José Maurício Santos, Ricardo Rocha and Catarina Rato, Bioclimatic and local drivers modulating the expansion of an introduced temperate reptile in a subtropical island, Global Ecology and Conservation, (2022) doi:https://doi.org/10.1016/j.gecco.2022.e02164), including the United States. iNaturalist has observations in North Carolina, South Carolina, Texas, and California. While dining at New River Taphouse in Virginia Beach, Myles Masterson noticed a Moorish Gecko on the wall. Upon further investigation, several more individuals of varying age classes were observed on the exterior of the building. The observation of juveniles is evidence of a reproducing population and justifies consideration of this species to be listed as *naturalized* to the Commonwealth. Although the origin of this introduction is unknown, it is most likely the result of escaped or released pets. Moorish Geckos are a relatively popular species in the pet trade. A digital photo was submitted as a voucher for this observation (VHS Archive #694).

**Myles Masterson**
Suffolk, VA

## PRESIDENT'S CORNER

Dear Members of VHS,

These past six months since the last Catesbeiana publication have been very eventful. We've had multiple field surveys as well as educational events. Our first in-person meeting since the pandemic was held this past November with speakers from across the state and at least 70 people registered. It was wonderful to see everyone gather to exchange knowledge and pleasantries. I will once again use this president's corner to update the membership on my goals as president which are to increase membership engagement and reform the leadership structure. I'd also like to touch on a couple of opportunities for conservation partnerships across state lines that have fallen into our region.

Initiatives for membership engagement continue to be successful. Last spring, we purchased Little Green Light (LGL) to better manage our membership list and increase communication. Our outreach coordinator, Kelly Geer, has taken the lead on LGL and has done a marvelous job maintaining our membership list. She continues to find new ways that LGL can work for the society, and I'm excited to see what the future brings to us on this front.

The education committee was allotted a budget which I mentioned in my spring 2022 president's corner. The education committee chair, Caroline Seitz who also won our member of the year award this fall, has revamped our committee materials and organized the committee to better reach more Virginians. She has many other plans for life-like resin replicas and regional education packages for our state-wide committee.

We are also attempting to organize an ecotourism trip for members, and create opportunities to see unique species outside of a survey. This is being done by chartering a boat to see different species of sea turtles in Virginia waters. I doubt many people would initiate a trip to see sea turtles by themselves. While I lived on the coast, I made an effort to see these creatures and had the chance to see our ocean's other wildlife. In environmental education, we refer to these experiences as MWEE – Meaningful Wetland Educational Experience. Exposing more people to the world around us creates an appreciation for our natural environment. That personal connection has the ability to drive us to take action to protect these sensitive ecosystems.

We are also making strides to be involved in the larger herpetology community. In order to better protect reptiles and amphibians, a network of organizations needs to exist across state lines. The Northeastern Partners in Amphibian and Reptile Conservation (NEPARC) had their annual conference this past summer in Davis, West Virginia. We sent our conservation chair, Yohn Sutton, to NEPARC and sponsored the event. A big thank you to Yohn for representing the VHS!

Another opportunity is soon approaching in the summer of 2023. The Joint Meeting of Ichthyologists and Herpetologists is coming to Norfolk, Virginia. This meeting is on an international scale and VHS does plan to be involved in some way. I am very excited to see these networking opportunities and forge relationships with neighboring herpetologists and organizations to better facilitate our society's mission.

One of my two goals as president is to restructure the leadership of our society. This will be done by reforming the bylaws. There, unfortunately, is not an update to be given on this front. We are restarting our bylaw committee meetings again in December and will be choosing our path forward to present suggested reforms.

In summary, we have made great strides in our membership engagement through our education committee and the management software Little Green Light. We hope to further engage members with the pelagic trip for sea turtles. We are also taking opportunities to engage with herpetological organizations outside of Virginia to ensure we are continuously engaged with conservation across our borders. With regards to our bylaws, we will be presenting proposed changes here shortly. Our combined efforts continue to further our goals of education, research, and conservation for our native herpetofauna. Please keep up the wonderful work each and every one of you do.

Erin Anthony
VHS President

**Oral Presentations at the Fall 2022 VHS Meeting:**

Brandon Crawford and Kevin Hamed, Virginia Tech. Stormwater Management Ponds Provide Habitat for Some Native as well as Non-native Turtles in Virginia.

Gill Houston, Maggie Thomas and Kevin Hamed, Virginia Tech. An update on the search for Pinesnakes in Virginia.

Olivia LoBalbo, AERO Animal Rescue. Box Turtle Injuries.

Meagan Thomas, Virginia Department of Wildlife Resources. Diamondback Terrapins: Biology, Conservation, and a New Citizen Science Initiative.

Billy Flint, James Madison University. Potential Influence of Competition on Local Occurrence of the Cow Knob Salamander (*Plethodon punctatus*) and White-spotted Slimy Salamander (*Plethodon cylindraceous*).

J.D. Kleopfer, Virginia Department of Wildlife Resources. Allegheny Alligators, Snot Otters, and Devil Dogs: Conservation of a Living Fossil – Eastern Hellbender.

Kurt Johnson, George Washington University. Notes on Development of Cope's Gray Treefrog, *Hyla chrysoscelis*.

Hannah Kelley, Liberty University. Genetics of an Isolated Population of *Plethodon hubrichti*.

Parker Ernst, University of Richmond. Assessing Human Influences on Ranavirus Infections in Vulnerable Turtle Populations.

Peter Uetz, Virginia Commonwealth University. Color Pattern Formation in Snakes.

**VHS Fall Meeting Notes:**
**DWR Headquarters, Henrico**
**VA 12 November 2022**

Grants committee- Kory Steele

Permits- Susan Watson
The VHS is currently in the process of renewing the exhibitors permits for FY2023. Any survey data done in 2022 is due by January 2023 in an accordance for renewing the permit for future surveys.

Bylaws Committee- Erin Anthony
The committee has not met in at least a year regarding discussions on bylaws. A decision was made and voted on at the 2022 fall meeting that the committee should meet on Wednesday nights at 7:00pm every two weeks to discuss bylaws. In order to fix the process of meeting, the committee will initiate their first meeting on Wednesday, December 7, 2022.

Newsletter-Yona Britto
Yona was not present for the meeting to discuss the newsletter. It was advised that John Orr may be the person to discuss the newsletter in a future meeting.

Outreach Committee- Kelly Geer
The outreach committee would like to update the membership list in order to send out thank you messages to members who have paid their dues. There had been discrepancies in the membership renewal process and the committee would like to have a way of communicating with members as a form of acknowledgement. Some members who have auto-renewals were unaware of this system and have requested to be removed. Discussions of additional benefits for lifetime members will be determined at a later meeting. The membership page link will be remedied on membership confirmation emails.

Merchandise- Erin Anthony
As of the spring committee meeting, it was decided a merchandise chair was not necessary. VHS merchandise will be brought to events to be sold. The café press program will continue to be used to sell merchandise. This program is not necessary; but since there is still a subscription that has already been purchased by the society, it will remain open until the subscription expires. The site will be updated for now. John White will be maintaining this project.

Legislation- Larry (not present)

RAWA: Recovering Americas Wildlife Act. Allocation of millions for state wildlife plans. The act did not make the agenda, so now it is semi defunct. The Act is mainly for non game conservation. A decision needs to be made if a letter to the senate needs to be established.

Conservation committee- Yohn Sutton
The Committee needs to define the purpose of the conservation committee so that it will not completely overlap the education committee. The committee would like to continue looking for fundraiser opportunities to assist state-wide herpetological research and maintenance of wild populations.
Survey committee-

Herpblitz – Jason Gibson (not present).
Carol Heiser suggested a 2023 survey at Powhatan State Park since it is their 10th anniversary. She could be contacted to help coordinate the logistics if it were decided to move forward with a survey there.

Catesbeiana- Paul Sattler

There are two papers and in excess of 30 Field Notes ready for the Fall issue. A request was made for the minutes to the fall 2022 meeting, the President's Corner, and Treasurer's Report as soon as possible to complete the publication. Future manuscripts should include the Brownsville survey, the Widewater State Park survey, and the more recent survey at Lake Anna State Park. Paul is worried about the longevity of the VHS Digital Archive. It is currently stored on a personal computer with a flash drive backup. A more secure repository is necessary. How much access the general public should have to specific locality information on sensitive species was discussed briefly. It was suggested an encrypted google drive would be a great way for ex comm to access information. A question on adding a public version of the archive was mentioned. The subject will be discussed later.

Education committee - Caroline Seitz

For the education report, multiple programs were completed. Nineteen members did more than thirty-six programs that reached over 77,000 individuals. Larry Mendoza did nine programs, which was the most in the group. Travis Anthony completed four programs, Susan Watson did six programs for the Department of Wildlife and Recreation, Megan Thomas completed four terrapin programs, Erin Anthony completed three programs for over 1000 individuals, and Jon and Sophie also completed educational programs. John White and Mike Clifford answered over 624 email herpetological related inquiries. The VHS facebook page received a positive amount of traffic and access. An access link in google docs for education committee information is available.

An emphasis on purchasing new supplies for outreach programs had a positive impact on educational events. Four new banners and educational supplies, that were discussed in the spring meeting, have made a positive impact on engaging the public in tabletop setting environment. Larry received a cart and pop-up tent purchased from the education budget to allow more efficient herpetological events. A total of $3164.00 of $4000.00 was spent out of the Education budget.

DWR books are available for table displays. A decision that DWR guides may be provided to members at no cost who are most in need of educational development was determined. The DWR guides are provided to VHS for sale and/or discretionary use to be distributed. The education committee requested higher quality replicas of local herpetofauna that will not be handled by the public during events. The purpose is to "exhibit" a realistic animal without having to provide a living specimen for educational usage. High quality replicas that will not be handled by the public. Creative labelling for replicas to maintain public interest has been discussed. Another idea for educational displays would be replicated herp skeletons and skulls. A question on whether electronic systems such as projectors, microphones, or PA systems were necessary during larger events was discussed. Education would also like to have informative handouts for events. One such suggestion was "pocket-sized" summary cards of venomous species in Virginia.

Slide presentations for educational events are in the group google drive for use. The Education committee suggested creating a training program for committee members in order to train current members and recruit future members for the committee. A

decision to increase the yearly education budget is up for a vote.

Treasurer's report - Matt Close
Most of the yearly income has come from dues. Members who had owed payment for spring merchandise purchases were also added to the report. This year the society sponsored the NEPARC meeting. Further discussion on funding conferences needs to be determined. More of the budget for tabling events and anyone who travels more than fifty miles per event needs to be reimbursed. The auction at the 2022 Fall meeting has generated over 1000.00 dollars, which very likely supports the costs for catering the meeting. There is no cost for the location. The web hosting fees are paid for the next five years. Fundraising future events to offset catered meeting costs or asking for donations from members was mentioned. Although there is money in the budget now, the discussion for being financially sustainable as a growing society is necessary. The society would want to offer more educational grants and new field equipment for future outings.

Website report – John White
There were 585,000 viewers to the website, over 58 million hits to the website and 4.75TB of bandwidth were used.

NEPARC:
Yohn Sutton attended the Northeast Partners of Amphibian and Reptile Conservation, (NEPARC), meeting to represent the VHS. Yohn noted that NEPARC did not have the VHS logo on banners as one of the sponsors of the event. Overall, the conference was a great way to connect and collaborate with naturalists, reptile experts, and field professionals. The conference took place in West Virginia at the Canaan Resort. Yohn learned technology aspects for fieldwork and there was discussions of diversity, equity, and inclusion (DEI) at an institutional and organizational setting. JD was present to do a presentation on Herpetological regulations from Maine to North Carolina.

The spring meeting discussion regarding the potential pelagic herp trip for summer 2023 was discussed. A survey was sent out to members and received a vote of forty-four positive responses who would want to bring family members on the chartered tour. Committee members voted Yes to VHS paying $6250.00 for a full day trip and/or $4500.00 for a half day trip with the stipulation that members will jointly payback the society for the tours. The price worked out to be roughly $125.00 per individual.

New Business agenda:

A Budget for the education committee will be revisited.

Yohn Sutton, VHS Secretary

**Virginia Herpetological Society**
**Treasurer's Report**
**November 11, 2022**

| | | |
|---|---|---|
| Previous Balance-June 09, 2022 | $ | 23,608.09 |
| **Receipts** | | |
| Dues | $ | 3335.00 |
| Donations | $ | 350.00 |
| Spring Meeting Merch | $ | 157.00 |
| CafePress | $ | 26.74 |
| Amazon Smile | $ | 89.12 |
| **Expenses (11/06/2021-06/08/2022)** | | |
| Little Green Light | $ | 486.00 |
| DWR Guide (Lizard+Snake reprint) | $ | 5000.00 |
| NEPARC (registration and travel) | $ | 734.07 |
| Tabling & Events | $ | 249.68 |
| Spring Survey Supplies | $ | 65.20 |
| Merchandise | $ | 61.28 |
| Postage | $ | 23.49 |
| Educational Materials | $ | 688.28 |
| Awards and Honors | $ | 96.53 |
| Donations (NEPARC) | $ | 255.58 |
| Fees (Paypal, etc.) | $ | 188.52 |
| Current Gross Balance | $ | 20,405.60 |
| Encumbered (reimbursements) | $ | 688.28 |
| Encumbered (remaining balance for education budget) | $ | 835.03 |
| **Current Available Balance (unencumbered)** | $ | 18,882.29 |

VHS Memberships (dues current)
Regular: 387
Student: 3
Lifetime: 95

**Total 485**

Matthew Close
VHS Treasurer

# Field Notes

The Field Notes section of *Catesbeiana* provides a means for publishing natural history information on Virginia's amphibians and reptiles that does not lend itself to full-length articles. Observations on geographic distribution, ecology, reproduction, phenology, behavior, and other topics are welcomed. Field Notes will usually concern a single species. The format of the reports is: scientific name (followed by common name in parentheses), state abbreviation (VA), county and location, date(s) of observation, observer(s), data and observations. The name(s) and address(es) of the author(s) should appear one line below the report. Consult the editor if your information does not readily fit this format. **All Field Notes must include a brief statement explaining the significance of the record** (e.g., new county record) **or observation** (e.g., unusual or rarely observed behavior, extremely early or late seasonal record, abnormal coloration, etc.). Submissions that fail to include this information are subject to rejection. Relevant literature should be cited in the body of the text (see Field Notes in this issue for proper format). All submissions will be reviewed by the editor (and one other person if deemed necessary) and revised as needed pending consultation with the author(s).

If the Field Notecontains information on a **new county (or state) record**, **verification is required in the form of a voucher specimen** deposited in a permanent museum (e.g., Virginia Museum of Natural History) or a **photograph** (print, slide, or digital image) **or recording** (cassette tape or digital recording of anuran calls) deposited in the archives of the Virginia Herpetological Society. Photographs and recordings should be sent to the editor for verification and archiving purposes; the identity of voucher specimens must be confirmed by a museum curator or other qualified person. Include the specimen number if it has been catalogued. Prospective authors of distribution reports should consult Mitchell and Reay (1999. *Atlas of Amphibians and Reptiles in Virginia*), Mitchell (1994. *The Reptiles of Virginia*), and Tobey (1985. *Virginia's Amphibians and Reptiles: A Distributional Survey*) **[both atlases are available on-line on the VHS website]** as well as other recent literature to determine if they may have a new county record. New distribution records from large cities that formerly constituted counties (Chesapeake, Hampton, Newport News, Suffolk, and Virginia Beach) are acceptable, but records from smaller cities located within the boundaries of an adjoining county will only be published if the species has not been recorded from that county. Species identification for observational records (e.g., behavior) should be verified by a second person whenever possible.

## PHOTOGRAPHS

High contrast photographs (prints, slides, or digital images) of amphibians and reptiles will be considered for publication if they are of good quality and are relevant to an accompanying article or field note. Digital images are preferred. Prints should be on glossy paper and no larger than 5 x 7 inches. Published photographs will be deposited in the Virginia Herpetological Society archives.

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